Indiana State Nonpoint Source Management Plan

2013 Update

Vision: "To restore waters impaired by nonpoint source pollution and maintain water quality in healthy watersheds through locally led partnerships."

Prepared by the
Indiana Department of Environmental Management
Office of Water Quality
Watershed Assessment and Planning Branch
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Acronyms List

AIMS	Assessment Information Management System
AOC	Area of Concern
AWEP	Agricultural Water Enhancement Program
BMP	Best Management Practice
BONWR	Big Oaks National Wildlife Refuge
CAFO	Concentrated Animal Feeding Operation
CALM	Consolidated Assessment and Listing Methodology
CCPI	Cooperative Conservation Partnership Initiative
CEES	Center for Earth and Environmental Science
CFU	Colony Forming Unit
CIG	Conservation Innovation Grant
CLP	Clean Lakes Program
CNPCP	Coastal Nonpoint Control Program
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSO	Combined Sewer Overflow
CSP	Conservation Securities Program
CWA	Clean Water Act
CWI	Clean Water Indiana
CWSRF	Clean Water State Revolving Fund
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
DO	Dissolved Oxygen
DOR	Division of Reclamation
EDF	External Data Framework
EPA	Environmental Protection Agency (U.S.)
EQIP	Environmental Quality Incentives Program
ERB	Environmental Review Board
EWPP	Emergency Watershed Protection Program
FFY	Federal Fiscal Year
FOTG	Field Office Technical Guide
FRPP	Farmland and Ranchland Protection Program
FSA	Farm Service Agency
FWA	Fish and Wildlife Area
GAO	Government Accountability Office
GIS	Geographical Information System
GLRI	Great Lakes Restoration Initiative
GRTS	Grants Reporting and Tracking System
GW	Ground Water
GWMN	Ground Water Monitoring Network
HAB	Harmful Algal Bloom
HR	Hoosier Riverwatch

HRI	Healthy Rivers Initiative
HUC	Hydrologic Unit Code
IAC	Indiana Administrative Code
IASWCD	Indiana Association of Soil and Water Conservation Districts
IBC	Impaired Biotic Communities
IBI	Index of Biotic Integrity
IC	Indiana Code
ICP	Indiana Conservation Partnership
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IGS	Indiana Geological Survey
IR	Integrated Report
ISDA	Indiana State Department of Agriculture
ISDH	Indiana State Department of Health
IU	Indiana University – Bloomington
IU-SPEA	Indiana University School of Public and Environmental Affairs
IUPUI	Indiana University – Purdue University Indianapolis
IWLA	Indiana Watershed Leadership Academy
LaMP	Lakewide Management Plan
LARE	Lake and River Enhancement program
LMCP	Lake Michigan Coastal Program
L-THIA	Long-Term Hydrologic Impact Analysis tool
mIBI	Macroinvertebrate Index of Biotic Integrity
MOU	Memorandum of Understanding
MRBI	Mississippi River Basin Initiative
MS_4	Municipal Separate Storm Sewer System
NASS	National Agricultural Statistics Service
NH_3	Chemical formula for ammonia
NIPSCO	Northern Indiana Power Service Company
NIRPC	Northwest Indiana Regional Planning Commission
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source pollution
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWQI	National Water Quality Initiative
OISC	Office of the Indiana State Chemist and Seed Commissioner
ORSANCO	Ohio River Valley Sanitation Commission
OSDS	On-site Disposal System (a.k.a. septic systems)
OSMRE	Office of Surface Mining Reclamation and Enforcement
OSRW	Outstanding State Resource Water
OWQ	Office of Water Quality (IDEM)
P.L.	Public Law
ppb	Parts per billion
ppm	Parts per million
PWQ	Pathway to Water Quality

QAPP	Quality Assurance Project Plan
QHEI	Qualitative Habitat Evaluation Index
QMP	Quality Management Plan
RAP	Remedial Action Plan
RC&D	Resource Conservation and Development District
RCaP	Rural Community Assistance Program
RPT	Recovery Potential Tool
RWWTF	Rural Wastewater Task Force
SIDMA	Social Indicators Data Management and Analysis tool
SMCRA	Surface Mining Control and Reclamation Act
SRF	State Revolving Fund
SSC	Suspended sediment concentration
SSCB	State Soil Conservation Board
SWAP	Source Water Assessment Plan
SWCD	Soil and Water Conservation District
SWOT	Strengths, Weaknesses, Opportunities and Threats analysis
SWQMP	Storm Water Quality Management Plan
TBD	To Be Determined
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TSS	Total suspended solids
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WASCoB	Water and Sediment Control Basin
WHIP	Wildlife Habitat Incentive Program
WLEB	Western Lake Erie Basin
WMP	Watershed Management Plan
WQC	Water Quality Certification
WQMS	Water Quality Monitoring Strategy
WQS	Water Quality Standards
WREP	Wetland Reserve Enhancement Program
WRP	Wetland Reserve Program
WSS	Watershed Specialist
WWH	Warm-water habitat

Mission Statements

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

The Indiana Department of Environmental Management's core mission is to implement federal and state regulations to protect human health and the environment, while allowing the environmentally sound operation of industrial, agricultural, commercial, and governmental activities vital to a prosperous economy.

OFFICE OF WATER QUALITY

The Office Water Quality's mission is to monitor, protect, and improve Indiana's water quality to ensure its continued use as a drinking water source, habitat for wildlife, recreational resource, and economic asset.

The office achieves this by developing rules, guidance, policies, and procedures; assessing surface and ground water quality; regulating and monitoring drinking water supplies and wastewater treatment facilities; and protecting watersheds and wetlands. The office also provides outreach and assistance to the regulated community and the public, while supporting environmentally responsible economic development.

Executive Summary

The Indiana State Nonpoint Source Management Plan ("Plan") guides the usage of Clean Water Act (CWA) Section 319 funds received by the Indiana Department of Environmental Management (IDEM) from the United States Environmental Protection Agency (U.S. EPA). Current U.S. EPA policy requires states to update their Plans every five years. This 2013 revision of the Plan is an update of the latest edition which was completed in 2008 (IDEM 2008).

Nonpoint source water pollution (NPS) in general is a reflection of land uses on a given watershed landscape. NPS in Indiana originates from a variety of sources, including agriculture, forestry, mining, and urban or residential land uses. Of the 63,130 miles of streams and rivers in Indiana and 106,205 acres of lakes, 27,452 miles of flowing waters and 43,613 lake acres are considered impaired for one or more designated use(s) (IDEM 2012a), the majority of which are believed to be impaired by NPS.

Indiana has formulated a multi-layered approach to the treatment of NPS that includes monitoring, targeted implementation, and education and outreach. Monitoring and modeling form the basis of the program. Watersheds eligible for 319 funding must be included on the current 303(d) List of Impaired Waters ("impaired waters"); or have had a Total Maximum Daily Load (TMDL) calculated for pollutants in the watershed; or have an approved watershed management plan (WMP). Indiana has targeted its restoration dollars to watersheds with impaired waters that have demonstrated stakeholder interest in tackling NPS issues and show the most potential for success. Section 319 watershed planning and implementation grant recipients undertake an outreach campaign for the local watershed and encourage the use of best management practices (BMPs) on targeted lands. Cost-share for those BMPs is often provided through a Section 319 grant or through the United States Department of Agriculture's (USDA) Farm Bill programs. As a result of these efforts, Indiana has been able to show successful restoration of several streams and watersheds (Table 6).

Over the next five years, Indiana's Section 319 program proposes to continue working with state, federal, and local partners to produce and implement watershed management plans. However, with shrinking funds available to continue this important work, Indiana proposes to work with partners to prioritize its watersheds for funding. Indiana will work to achieve a balance between restoration and protection activities funded through its programs.

This Plan will be reviewed annually by program staff to assess its continued validity. The next full revision of this program plan will be completed in FFY 2018.

Purpose of the Indiana NPS Management Plan

The need to protect America's waterways from anthropogenic pollution has been an issue of national significance for well over a century. In 1899 Congress passed the Rivers and Harbors Act, legislation which, among other actions, prohibited the dumping of refuse into navigable waterways or their tributaries. The Federal Water Pollution Control Act was first enacted in 1948 and addressed public health issues relating to the polluted condition of ground and surface water. The Act was amended many times between 1948 and 1987, but perhaps the most significant of these revisions occurred in 1977.

The 1977 Amendments to the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), outlined actions to be taken by the nation in order to mitigate pollutants in, and prevent further pollution to, surface waterbodies in the United States of America. The goal of the CWA was to restore and maintain the chemical, physical, and biological integrity of the Nation's waters, with an interim goal of "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983"(P.L. 95-217). While early CWA implementation actions by the nation and states focused on mitigating point source pollution by regulating industry and municipal waste through the National Pollutant Discharge Elimination System (NPDES program), it became clear that additional federal assistance was needed to address nonpoint source (or "run-off") pollution. To address this need, the U.S. Congress amended the CWA in 1987 to establish the Section 319 Nonpoint Source (NPS) Management Program (Appendix A).

Nonpoint source pollution is that pollution carried to rivers, streams, lakes, ponds, wetlands, and ground water through storm water run-off, run-off from snowmelt, and atmospheric deposition. It is diffuse in nature and difficult to control, often having many contributing sources.

The Section 319 NPS Program exists today primarily as a grant program with funding provided each year by Congressional appropriations under CWA Section 319. These funds are distributed to the U.S. Environmental Protection Agency (U.S. EPA), and then to the states, tribes, and territories of the United States to control NPS pollution.[1] States are required to identify, through CWA Sections 303 and 305, those waterbodies that do not meet water quality standards, including those impaired by NPS. The states then outline a NPS management program (Plan) to mitigate NPS (subject to approval by U.S. EPA) and request Section 319(h) funding to implement their program. The NPS Management Plan guides states' efforts to identify strategic priorities, develop goals and milestones, and work effectively to address the evolving state of their waters and engage partners to address statewide NPS priorities. The financial assistance provided is commonly used for pass-through grants, in which states competitively award funding to statewide and local

[1] Because of the unique relationship between U.S. EPA and First Nations and territories of the United States, only state grants and programs (including territorial programs when territories are "treated as states") will be discussed here and elsewhere in this document.

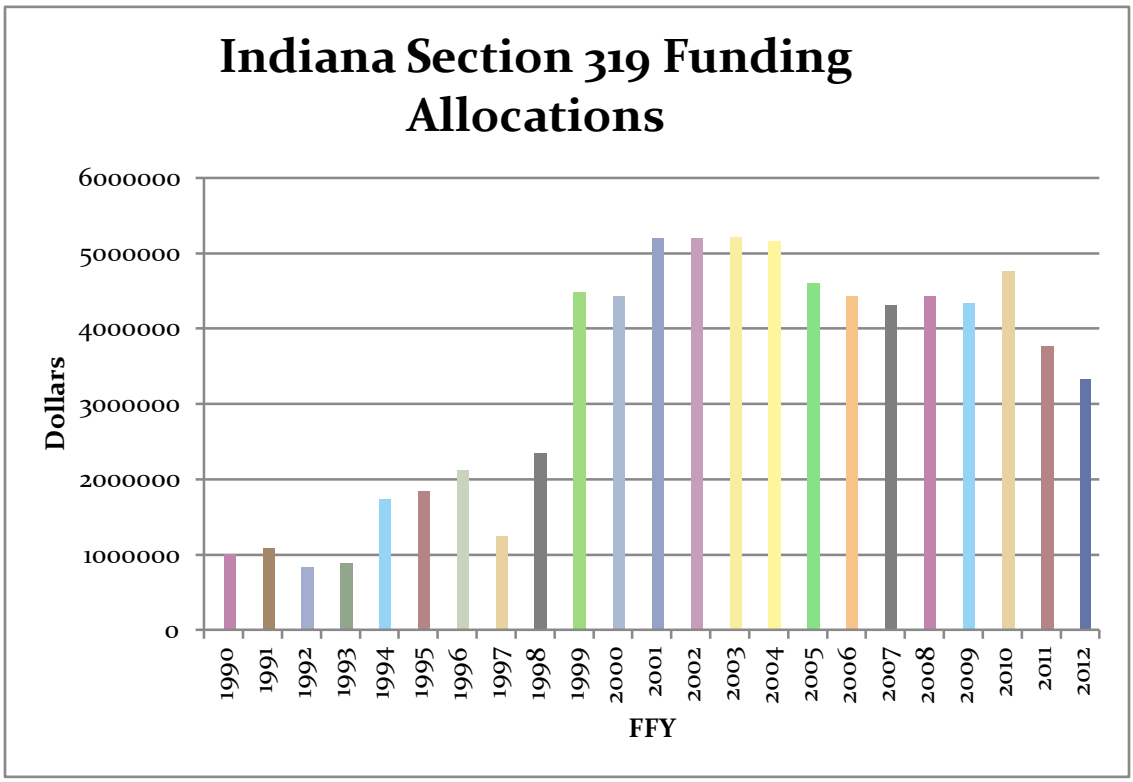

Figure 1. Section 319 Funding Allocation for Indiana.

initiatives to address NPS pollution, and for NPS Program administration to manage the funds and establish statewide NPS initiatives. Section 319 funds can be used for activities such as technical assistance, financial assistance, planning, education, training, technology transfer, demonstration projects, and monitoring to assess the success of NPS implementation projects.

Federal funding levels for the 319(h) program have fluctuated over the years since its enactment (Figure 1). Indiana received its maximum funding allocation of $5,220,600 in federal fiscal year (FFY) 2003. Since that time, a downward trend in funding level has been observed. In light of this shrinking federal funding for the Section 319 program, as well as major NPS-fueled water quality problems such as hypoxia in the Gulf of Mexico and sedimentation and algal blooms in Lake Erie, the efficient use of NPS funds is now more urgent than ever. A study done by the Government Accountability Office (GAO) in 2012 found that both U.S. EPA and states can do more to ensure that NPS funding is spent according to the most efficient use of funds (GAO 2012). U.S. EPA performed a similar study in 2011 to evaluate the 319 program (EPA 2011). As a result of these two studies, U.S. EPA has formulated new guidelines for the 319 program, including revised guidance to U.S. EPA Regions on how to make consistent satisfactory progress determinations for the states, updated guidance for state NPS management plans, and updated NPS Program and Grants Guidance that includes a requirement that 50% of states revise their state NPS management plans by September 2013.

Indiana's State NPS Management Plan was last updated in 2008. This Plan revision will describe Indiana's strategies for reducing and preventing NPS through program implementation, and document the methods Indiana will use to meet the criteria included in the U.S. EPA guidance "Eight Key Elements of an Effective State Program" (Appendix B).

Physical Inventory

Demographics, Population & Location

The State of Indiana covers more than 36,000 square miles in the Midwestern/Great Lakes Region of the United States and has a population approaching 6.5 million. Prior to European settlement, the state was predominately forested (primarily oak-hickory and beech-maple climax communities) and included large tracts of wetland in the north and small patches of prairies scattered throughout. Major rivers ran clear enough to see the substrate, as attested by the Native American names "Wabashiki" ("water over white stones") and "Wapahani" ("white sands") for the Wabash and White Rivers, respectively.

The state can be divided into several ecoregions: the Eastern Corn Belt Plains, Interior Plateau, Interior River Valleys and Hills, Central Corn Belt Plains, and Southern Michigan/Northern Indiana Drift Plains (Figure 2).

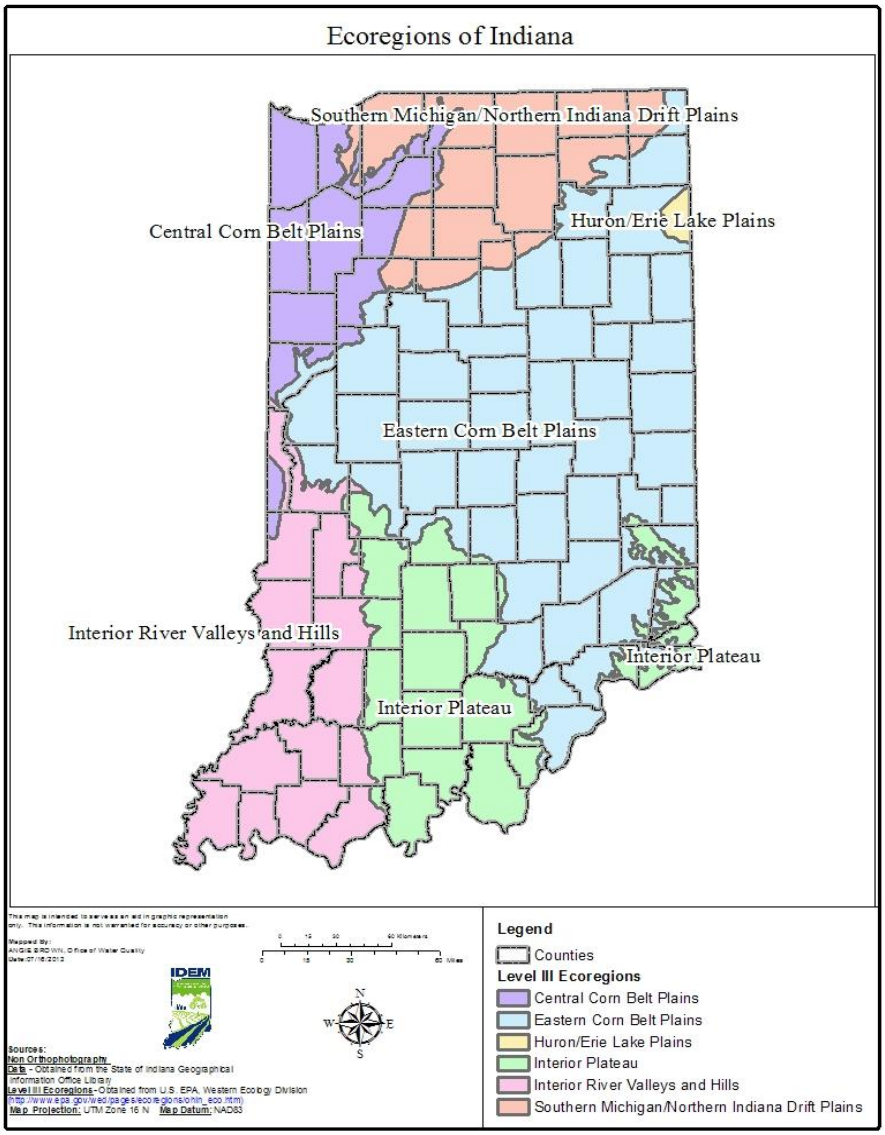

Figure 2. Ecoregions of Indiana. Data from http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm

Geology

Bedrock and Glacial History

Indiana is underlain by six different types of bedrock (limestone, shale, dolomite, sandstone, siltstone, and coal) from five distinct geological periods (Figure 3). The topography of the state's bedrock drives drainage patterns to some extent. The highest points on the bedrock surface are found in Randolph and Wayne Counties, on a plateau from which four major river systems originate (White, Wabash, Whitewater, and Great Miami Rivers). The lowest bedrock elevations are found in Posey and Vanderburgh Counties, near the confluence of the Wabash and Ohio Rivers.

The composition of bedrock has important implications for hydrologic networks in the state. In particular, limestone and dolomite are unstable over time, creating challenges for Indiana's construction and agricultural industries and recreational opportunities for Hoosier spelunkers. Limestone and dolomite were formed from the lithified remains of aquatic sea creatures that resided in the shallow sea covering Indiana during the early Paleozoic era (from the Cambrian through the Devonian period - approximately 542-359 million years ago) (Appendix C). These materials are rich in calcium carbonate and subject to dissolution from slightly acidic rain waters. As a result of this dissolution, cave systems, sinkholes, and sinking streams are formed, to create a landscape known as "karst." Karst geology is present in south-central and south-eastern Indiana. It is generally extremely vulnerable to pollution as surface water can bypass the filtering soil and infiltrate straight into ground water.

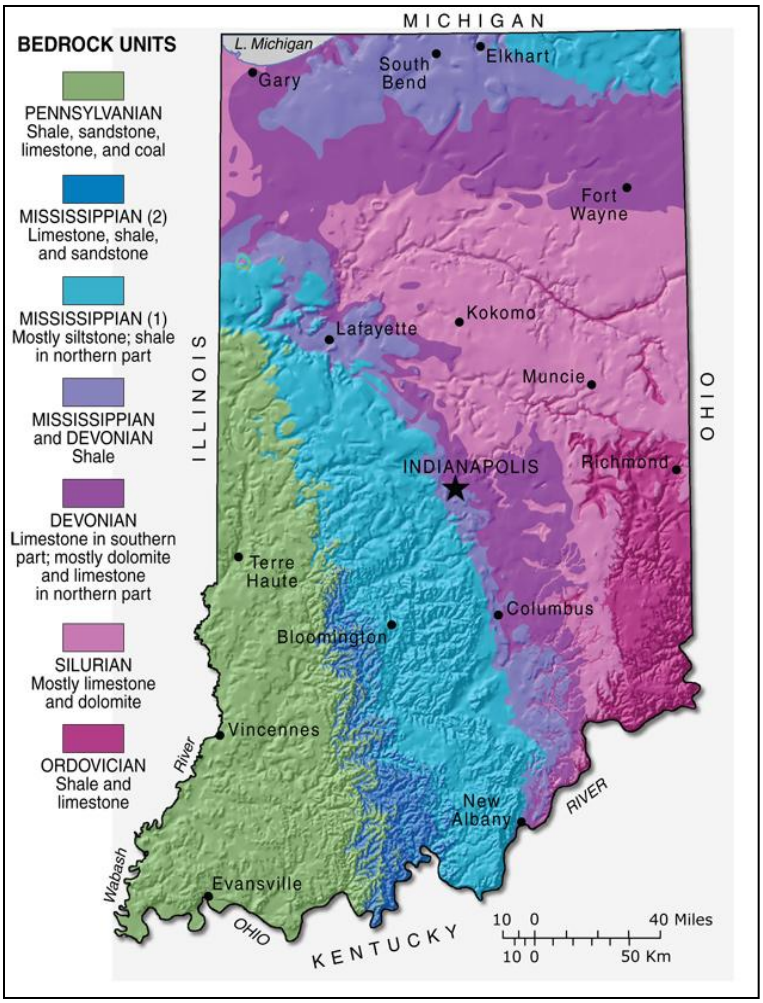

Figure 3. Bedrock Units of Indiana. (From Indiana Geological Survey; available from http://igs.indiana.edu/Bedrock/)

The surficial topography of Indiana has been shaped in large part by at least three major glaciations events of the Pleistocene epoch: the pre-Illinoian, Illinoian, and Wisconsin glaciations.

As the shallow seas that covered Indiana receded, deposits of limestone, shale, siltstone, dolomite, sandstone, and coal were left exposed to the erosive forces of wind and water. Over time, erosion and deposition caused soil to form atop the exposed bedrock. Around 2.5 million years ago, the most recent Ice Age began. Ice sheets from the Arctic reached down into the area that is now the United

States, eroding, churning, and depositing the sediments born from bedrock. Several such events likely took place between 700,000 and 300,000 years ago, but since it is very difficult to characterize their chronology and extent, geologists simply refer to them as "pre-Illinoian." During the Illionoian glaciation (300,000-140,000 years ago), the ice sheet penetrated the majority of the state, excepting an upside-down "U"-shape that ranged from the Wabash-Ohio River confluence in the southwest, up to the Morgan-Monroe County line, and back down to present-day Jeffersonville in the southeast. When this ice sheet retreated, it left several tens of feet of sediment throughout its range in Indiana. The last glaciation occurred ca. 50,000 years ago when the Wisconsin glacier advanced into Indiana. It reached as far south as central Indiana, flattening the landscape and creating glacial lakes in northern Indiana, but leaving the rolling hills of southern Indiana virtually untouched.

Soils

Soil types in Indiana vary widely from well-drained prime farmland soils in the central and north-central region to the sandy soils of northwestern Indiana to very-poorly drained, mucky soils in certain parts of the central and east-central regions and southern bottomlands. Soil-related NPS concerns include erosion from highly erodible and potentially highly erodible lands, depth to bedrock or ground water, potential nutrient runoff, hydric soils, and septic system suitability.

Statewide, nearly 2.4 million acres of cropland have been classified as "at risk" for sheet and rill erosion. Of those at-risk acres, 90% still need treatment. In addition, about 1 million acres of pasture and 2.4 million acres of forestland are also at risk due to sheet and rill erosion, with nearly 98% of pasture and 99.7% forest at-risk acreage still needing protection. While sheet and rill erosion are problematic in most of the state, soil damage via wind erosion is a concern in the northwestern portion of the state (NRCS 2011).

Field Indicators of Hydric Soils for All Soils	
A1.	Classified as a Histosol or Histel
A2.	Histic epipedon underlain by mineral soil material with chroma 2 or less.
A3.	Black Histic.
A4.	Hydrogen sulfide odor within 30 cm of soil surface.
A5.	Stratified Layers starting within the upper 15 inches.
A6.	2% or more organic bodies of muck or mucky modified mineral texture starting within 15 cm of soil surface.
A7.	Mucky mineral layer 5 cm or more thick, starting with 15 m of soil surface.
A8.	Layer of muck starting within 15 cm or more of the soil surface.
A9.	1 cm muck or more thick within 15 cm of surface.
A10.	2cm or more muck layer starting in first 15 cm.
A11.	Depleted below dark surface.
A12.	Thick dark surface.
A13.	Alaska gleyed
A14.	Alaska redox.
A15.	Alaska gleyed pores.
A16.	Coast prairie redox

Table 1. Selected Field Indicators of Hydric Soils. (NRCS 2010)

To a degree, soil can act as a filter of suspended and dissolved particles, chemicals, and compounds. As surface water infiltrates, then percolates through soil, a variety of substances can become adsorbed, altered, or taken up by roots and microorganisms. The degree to which the soil can clean polluted water is highly variable, depending upon soil type, pollutants involved, and depth to ground water or impermeable materials. Where these conditions allow shortened contact time between the soil and pollutants, the risk of pollutants reaching the water table or surface water (through surface water recharge via ground water) is increased. Nutrients, pathogens, pesticides, and household hazardous waste (e.g. paint, oil poured out on the ground) are some of the NPS pollutants of concern in these scenarios.

Depth to bedrock and to ground water is highly variable throughout the state. In the glaciated northern 2/3 of Indiana, bedrock is covered by a relatively thick layer of unconsolidated materials (i.e. "soil"); while in the southern portion of the state, depth to bedrock is relatively shallow and exposed outcroppings of bedrock sometimes can be found.

Hydric soils are soils that have formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register 1994). Though these soils may be drained through the employment of open ditches or drainage tiles, which effectively lower the water table, indicators of prior wetness remain present (Table 1). Hydric soils are one criteria of a wetland determination and may provide an indication of where historic wetlands may have existed, and could be prioritized, for restoration purposes. Hydric soils are generally very limited to somewhat limited in their suitability for dwellings, out-buildings, roads, shallow excavations, lawns, septic systems, and landfills. Approximately 24% of the major soil components in Indiana are hydric.

Septic system suitability

Where wastewater treatment plants and sanitary sewer connection lines are not available, residents and commercial establishments treat their wastewater using "septic systems." Though there are many different kinds of septic systems employed to treat wastewater under a variety of soil conditions, these types of treatment systems always consist of a tank to hold solids and a mechanism to filter effluent. The tank is typically made of concrete and is buried near the home or building. A wasteline brings effluent into the tank, where solids separate into two layers: scum (soap, grease, toilet paper) that floats to the top and solids (sludge) that settle to the bottom. Settled solids are broken down into organic matter by the anaerobic bacteria that naturally colonize the tank. The liquid effluent is passed through the tank chamber into the drainage field through the tank's outlet line. The effluent infiltrates the soil through the "fingers" of the drainage field, and then moves through the soil's pore spaces where microorganisms found in the pores of the soil break down additional bacteria and viruses that are present in the liquid. Other impurities also decompose in the drainage field. Eventually this purified water is taken up by nearby plants or deposited to ground water.

Septic systems depend, in large part, on soil porosity to treat wastewater. In order to operate properly, the tank must be pumped on a regular basis so that solids do not reach the level of the effluent line and escape to clog the drainage field. In addition, the effluent must have proper contact time with the soil so that the soil microorganisms can treat pathogens and adsorb or decompose impurities. Soils that are very well-drained (such as sandy soils) or are very wet (e.g. due to flooding), do not provide enough time for treatment before the effluent reaches the ground water. In addition, soils with a high clay content ("tight" soils), that have been compacted, or contain an impermeable layer, may not allow sufficient infiltration and create ponded conditions on top of a typical drainage field. In these types of soils, mounded or dosed systems may be more appropriate than a conventional drainfield.

The Natural Resources Conservation Service (NRCS) has rated all soils in Indiana for their suitability to be used as a conventional septic system drainage field. This rating system ranges from "very limited" for septic systems to "not limited." In Indiana, approximately 5% of soils are suitable for use as a conventional septic system drainage field. Modifications to septic systems can typically overcome soil limitations. Even so, it is estimated that 25% of the state's residential septic systems are inadequate and have failed or are failing to protect human health and the environment (Lee et al. 2005).

Current Land Use

Land Use	Acres	Square Miles	Percentage
Agriculture	**12,677,093**	**19,807.96**	**54.42**
Developed, High Intensity	**105,453**	**164.77**	**0.45**
Developed, Medium Intensity	**225,876**	**352.93**	**0.97**
Developed, Low Intensity	**681,388**	**1,064.67**	**2.93**
Developed, Open Space	**1,466,649**	**2,291.64**	**6.30**
Forest	**5,232,261**	**8,175.41**	**22.46**
Hay/Pasture	**1,711,464**	**2,674.16**	**7.35**
Open Water	**411,167**	**642.45**	**1.77**
Shrub/Herbaceous	**433,637**	**677.56**	**1.86**
Wetlands	**348,422**	**544.41**	**1.50**

Table 2. Indiana Land Use. (From Fry 2011, 2006 National Land Cover Database (NLCD), http://www.mrlc.gov) *Note: the wetland acres and percents differ between the NLCD and state data. In light of the ground-truthing done to verify acreages, and wetland types, the state numbers will be carried through this plan

Land use information for Indiana was compiled in 2006 as a part of the National Land Cover Dataset, hosted and made available by the Multi-Resolution Land Characteristics (MLRC) Consortium (a federal partnership led by the United States Geological Survey (USGS)). As a part of that effort, land cover information available via satellite was converted into (among other things) corresponding land uses (Figure 4). The largest land use in Indiana is agriculture (61.77%, when hay and pasture are included), followed by forested use (22.46%). Various developed land uses account for 10.65% and wetlands and open water make up 3.27% of the state (Table 2). For the purposes of the NPS program, land uses will be characterized as "rural" (for agriculture, forestry, mining, wetlands and open water running through these landscapes) and "urban" (including cities and towns, residential areas in more rural locations, and open water surrounded by such uses).

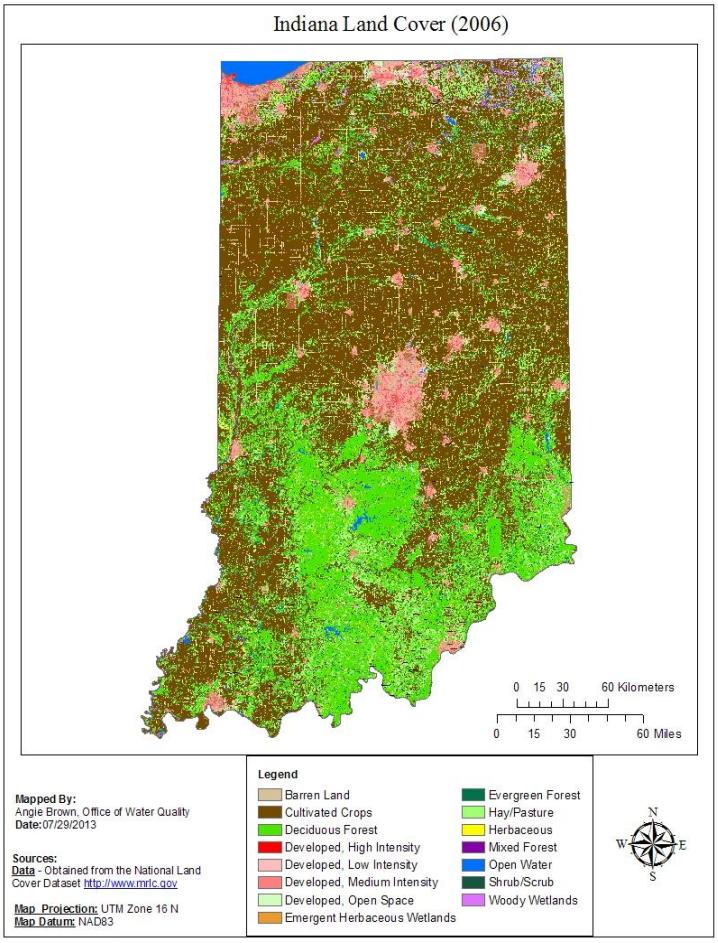

Figure 4. Indiana Land Use. (From Fry 2011, 2006 National Land Cover Database (NLCD), http://www.mrlc.gov)

Rural Land Uses

Since European settlement, Indiana has been predominately an agricultural state, though large tracts of forest cover remain in the southern and central portions of the state (Figure 4). In 2011 (the last year for which statistics are available), the National Agricultural Statistics Service (NASS) indicated that Indiana ranked 3rd in the nation for its inventory of laying hens and 5th in the nation for both the value of its grains (including corn, wheat, oilseeds, dry soybeans, and dry peas) and for the value of its hogs and pigs. This same year Hoosier farmers harvested nearly 6 million acres of corn, 5.3 million acres of soybeans, and 670,000 acres of hay. The state also maintained an inventory of 860,000 head of cattle (beef and dairy); 3.85 million hogs; 55,000 sheep; and some 37 million chickens. Indiana also boasts a good number of specialty crops (such as tomatoes, sweet corn, watermelons, cantaloupes, and spearmint) and livestock (such as alpacas, buffalo, and honeybees). In 2011, the Indiana agricultural industry netted some $4 billion (NASS 2012).

Not all land used for agricultural production in Indiana is operator-owned. A 2012 study reported that 55% of farmland acres in Indiana are absentee-owned. The NASS indicates that $752 million was paid as cash rent to produce crops on non-farmer owned lands in Indiana in 2011. In many cases, the actual landowners are absent from the county or state[2], often leaving the question of authority for agricultural management decisions (such as the installation of agricultural BMPs) somewhat ambiguous. This absentee landowner issue is a large one for Indiana conservation organizations to address and overcome.

In 2010, Indiana exported $278 million dollars worth of livestock products, nearly $767 million in corn (grain), and $1.5 billion in soybeans. Of the nearly 11.7 million acres of row crops planted in Indiana in 2011, 6.6 million were in conservation tillage (30% or more crop residue remained during planting) and the remainder were in a reduced tillage (16-30% residue cover) or conventionally-tilled (Figure 5). Conventional tillage leaves less than 30% residue on the land after planting, leaving the soil vulnerable to wind and water erosion.

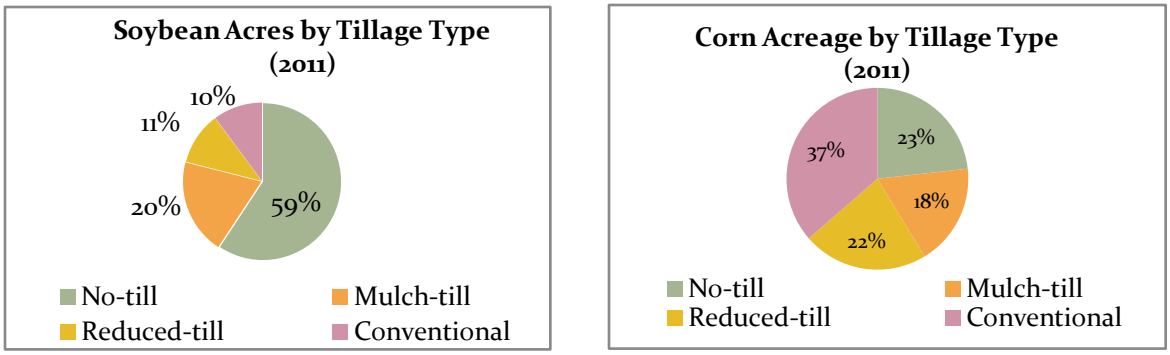

Figure 5. Tillage by commodity. (ISDA 2011).

In addition to row-crop and livestock agriculture, the state boasts approximately 5 million acres of forested land – approximately 20% of the land base. Ninety-eight percent of these acres are classified as "timberland" (forested land in which at least 20 ft^3 per acre is produced at peak

[2] A study done by Agren, Inc (of IA) and Peggy Petrzelka (of Utah State) states that 55% of farmland in Indiana is absentee-owned. Available from http://news.jrn.msu.edu/capitalnewsservice/2012/03/16/more-land-owned-by-absentees-study-finds/

productivity) and 2% of forested land is "reserved" (not harvested for timber). To qualify as "forested land," shelter belts and riparian areas must be at least 120 feet wide. The prevailing forest types are oak-hickory types. Surveys conducted by the United States Forest Service (USFS) indicate that Indiana is gaining forested land (Woodall et al. 2011).

Indiana's forest industry is the sixth largest manufacturing industry in the state. The state ranks first nationwide in the production of wood office furniture, wood kitchen cabinets, and hardwood veneer, along with several other products. Nearly $13.6 million in forest products were sold in Indiana in 2011.

Urban Areas

Significant urban areas in the state include Indianapolis and its suburbs in central Indiana, the suburbs of Chicago in the northwest, Ft. Wayne in the northeast, and the South Bend/Elkhart area in the north. Smaller urban areas are spread out throughout the state; locations of note include Anderson, Bloomington, Evansville, Lafayette, Muncie, and Terre Haute. Despite the fact that developed space is only about 11% of the land cover in the state, the majority (77.4%) of Indiana's population lives in the urban areas.

Urban areas can be a large source of NPS, especially when best management practices are not used by a large population base. Common urban sources of NPS include construction activities, pet waste, fertilizing grassy areas, run-off from impervious surfaces, nuisance waterfowl waste, residential car washing done on the street or in the driveway, and stream bank erosion. Polluted waters from these activities can run over land or enter storm sewers to discharge directly into streams. To mitigate the pollutants generated by populated areas, the U.S. EPA, together with the state, has designated certain populated areas such as cities, towns, universities, colleges, hospitals, military bases, and certain correctional facilities to be permitted for their discharge of urban storm water run-off. These permittees are known as "municipal separate storm sewer systems" or MS4s. Indiana's MS4s are regulated under 327 IAC 15-13 or "Rule 13" and are issued a National Pollutant Discharge Elimination System (NPDES) permit. In MS4 areas, much of the discharge from urban areas is typically generated from overland flow, but the discharge to the waterbody itself is from storm sewers, technically making the discharge a "point" source discharge.

One-hundred eighty-six MS4s have been designated in Indiana (Appendix D), though in many cases, two or more entities were co-permitted. These NPDES permits are reviewed and re-issued (as applicable) on a 5-year cycle. MS4 entities must submit a Storm Water Quality Management Plan (SWQMP) to IDEM that includes a baseline characterization and program implementation elements. Program elements must include the following six minimum control measures:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Run-off Control
5. Post-construction Storm Water Run-off Control
6. Municipal Operations, Pollution Prevention, and Good Housekeeping

Most MS4 municipalities have local storm water ordinances in place, and many fund their SWQMP activities through a storm water utility. Even though the pollution being mitigated through MS4 regulation could be considered NPS, regulated activities specifically outlined in the

SWQMP cannot be funded with Section 319 funds. However, any NPS activity that goes "above and beyond" the SWQMP may be funded through Section 319 funds.

Mineral, oil and gas extraction

Coal and Minerals

Southwestern Indiana includes land rich in minerals such as coal, clay, shale, and shale oil (Figure 6). The Indiana Geologic Survey (IGS) estimates that Indiana has approximately 57 billion tons of unmined coal resources, of which 17 billion tons are recoverable using current technologies (IGS 2011a). As of the end of 2012, there were 30 active coal operations (DNR 2013a), two gypsum mines, and six shale and/or clay mines covering 590.95 acres in southwestern Indiana (IMCC 2012). Of these activities, the coal industry is the largest and has the potential to greatly impact water quality in the state.

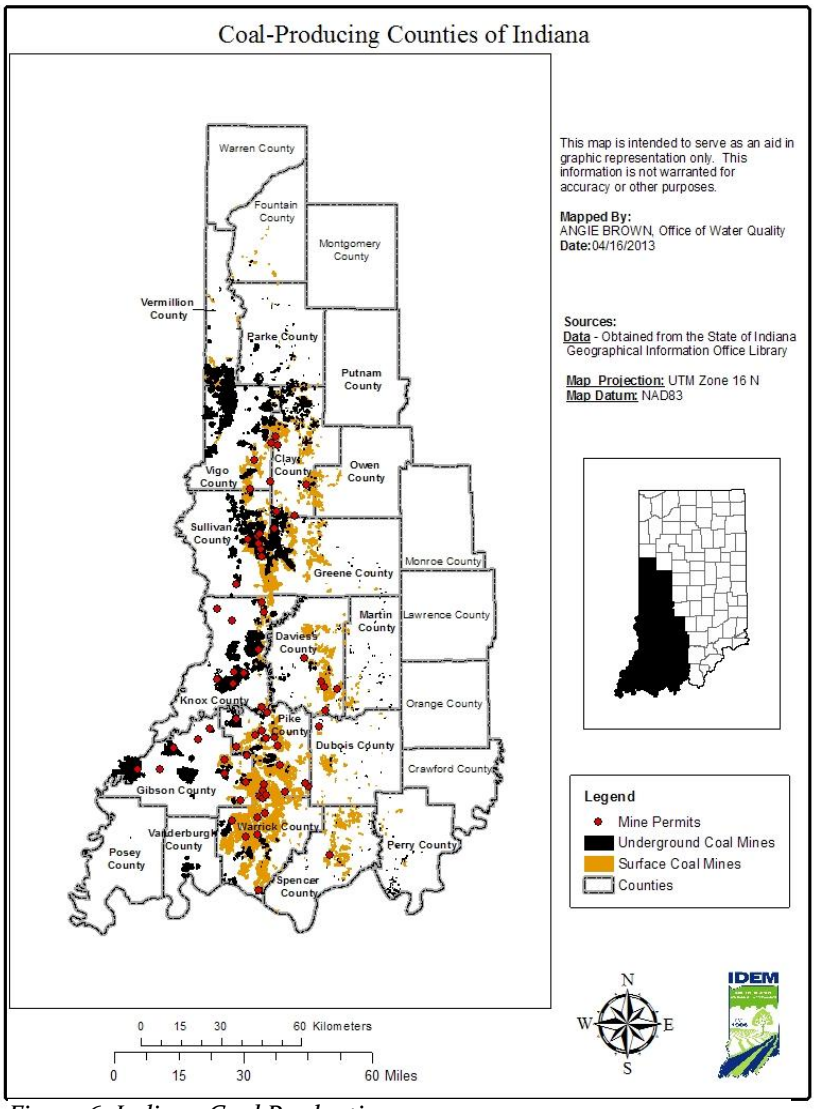

Figure 6. Indiana Coal Production.

Coal mining in Indiana dates back to the 1800s. Prior to 1941, there was no state or federal requirement that coal mining companies address environmental concerns resulting from the abandonment of spoil piles, coarse-grain refuse and tailings. Though some coal mining companies voluntarily began reclamation activities, not all companies took it upon themselves to do so. Major NPS concerns from barren gob piles and tailings include erosion and acid mine drainage. Acid mine drainage occurs when water flowing through slurry waste piles becomes acidic, due to the reaction of water with sulphur-bearing materials in the waste. The reaction creates sulfuric acid, which then leaches heavy metals out of the rocks it comes into contact with. These waters are dangerous to humans, and aquatic life generally cannot tolerate the low pH present in these environments. There is some evidence of acid mine drainage to waters of the state in southwest Indiana.

In 1941, Indiana passed a law that required coal mining companies to plant trees on spoil banks. By 1967, Indiana's mining regulations had incorporated additional protections for mined land,

including provisions to allow farming activities, burial of certain acid-forming rocks, grading specifications, and a requirement for a performance bond so that reclamation activities would be guaranteed. Nationally, the environmental standards of the coal mining industry changed dramatically with the enactment of the federal Surface Mining Control and Reclamation Act (SMCRA) of 1977 (30 U.S.C. 25), which mandated that the coal industry take steps to control the environmental impacts of coal mining. SMCRA provides authority for the federal Office of Surface Mining Reclamation and Enforcement (OSMRE) to support and oversee state mining regulatory programs, as well as providing grants and oversight to state abandoned mine reclamation programs. Today, the state of Indiana, through the Department of Natural Resources (DNR) Division of Reclamation, oversees the mining and reclamation activities of 30 coal mines and the production of 32-36 million tons of coal per year.

Coal mining sites that are no longer active (whether abandoned or properly closed according to an IDNR-approved mine reclamation plan) can be rehabilitated for many land uses, including farmland, forest land, wildlife habitat, wetlands, and recreation areas. As of 2013, a total of 1,220 abandoned mine sites have been reclaimed by the IDNR-DOR, at a cost of nearly $164 million. An additional 139 bond forfeiture sites have also been reclaimed at a cost of $11.8 million. Currently in the State of Indiana, there are approximately 2,600 acres of abandoned mine lands that are still in need of reclamation (S.Herbert, personal communication, 07/30/2013).

Aside from coal, several other minerals are mined in Indiana. The soft mineral gypsum is mined from two underground mines in Martin County. The deposit is 350-600 feet beneath the surface and can be up to 16 feet thick. Gypsum is used to make drywall, cement, soil amendments, plaster of Paris, and finishing compound.

Southern Indiana also includes a belt of limestone situated between Bloomington and Bedford, where 2.7 million cubic feet of "Indiana limestone" (technically Salem limestone) is excavated from nine quarries annually for its uses in the building industry. In addition, sand and gravel seams, peat, and marl are distributed widely throughout the state. While 150 active sand and gravel mines across the state produce 25 million tons annually, some 2000 sand and gravel quarries have been abandoned, with potential nonpoint source impacts on ground water. Water quality concerns from these mining activities include pesticide and fertilizer run-off leaching into ground water through abandoned quarries and erosion concerns.

Oil and Gas

Exploration of subsurface oil and gas probably began in Indiana during the middle of the 1800s stemming from early drilling for salt recovery and precipitation. Although gas springs and oil seeps were discovered in counties in southern Indiana along the Ohio River in the 1860s, the first major exploitation of gas and oil began with the discovery of the Trenton Field in east-central Indiana in 1876. This explosion in oil and gas development precipitously declined in the early 20th century due to wasted resources and poor drilling practices. As the Trenton Field exploration and exploitation declined, reserves in the Illinois Basin in southern Indiana were discovered and developed throughout the mid-1900s. Overall, the amount of oil production in Indiana has declined since the 1960s (Figure 7).

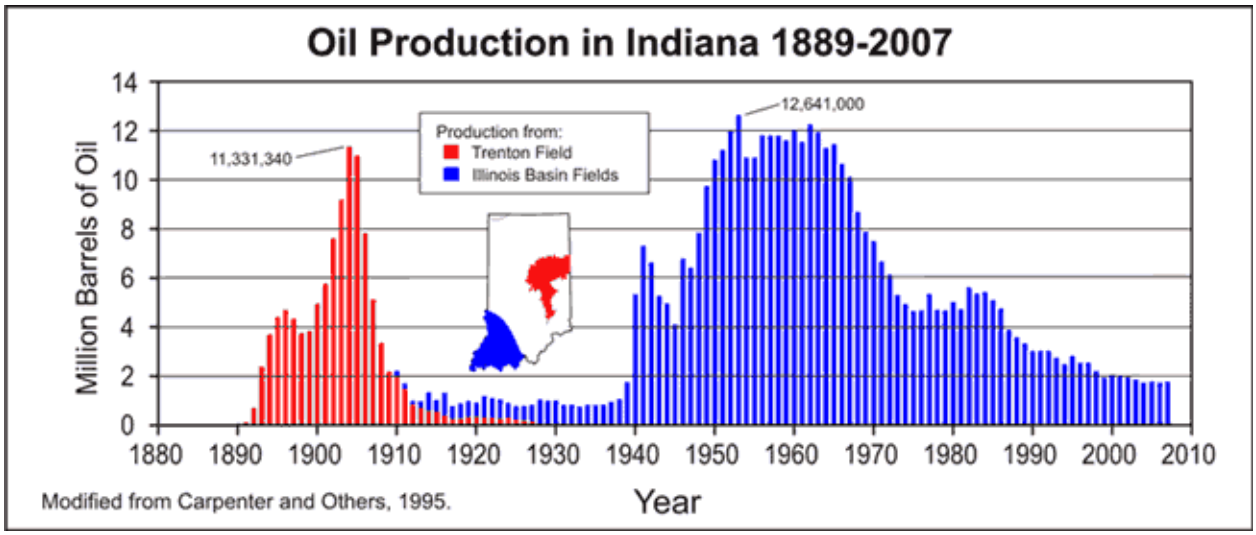

Figure 7. Historical Oil Production in Indiana (http://igs.indiana.edu/OilGas/History.cfm)

Unlike the shallower pits and mines created for mineral and coal mining, oil and gas wells in the U.S. average nearly 8,000 feet deep. The majority of Indiana has been drilled and explored for oil and gas, but only in the shallow range of the first few thousand feet. This restricted exploitation of only the shallow surface has potentially left undiscovered reserves of oil and gas available at greater depths. These potential deep, and unexplored, reserves may be more accessible with the advent of new technologies in oil and gas extraction, including but not limited to the application of advanced seismic acquisition and processing techniques, new drilling technologies including horizontal drilling and shale fracturing, and complex completion techniques such as CO_2 stimulation.

While early primitive drilling and oil extraction techniques had the potential to lead to surface "blow outs" and environmental contamination, modern techniques use blow out preventers that keep material within the bore-hole, preventing contamination to the environment. Although modern controls can prevent surface contamination, by-products from oil and gas wells (such as brine) can reach shallow ground water aquifers through poor maintenance and defunct equipment, including corroded well casings and leaking storage tanks and/or pipelines. The proper handling of by-products from finishing can also be of concern to water resources if not disposed of properly. As new techniques are developed, including high-volume hydraulic fracturing, it will be important to keep up on the transparency of chemical use and the elimination of potential ground water contamination pathways. The IDNR, Division of Oil and Gas is charged with regulating petroleum exploration, production and site abandonment activities, underground injection control, test hole drilling, and geophysical surveying operations.

Available IDNR records from 1986 to 2009 show that there have been 6,425 oil permits and 1,451 gas permits approved in Indiana. The total oil production in Indiana for 2010, the last year on record, was approximately 1.8 million barrels. At an approximate price of $73.46 per barrel, the total production of oil in dollars from 2010 was roughly $134 million. The total gas production in Indiana for 2010 was approximately 6.8 million Mcf (an Mcf is 1000 cubic feet of gas). At an approximate price of $4.13 per Mcf, the total production of gas in dollars in 2010 was roughly $28 million. Although there seems to be no upward trend in total oil production, there appears to have been an increase in total gas production over the last ten years (DNR 2013b).

Indiana's Hydrology

Watersheds

NPS pollution is often called "run-off" pollution because pollution "runs off" the watershed and into the body of water. A watershed is an area of land that collects and drains water from high points (hills) to low points (valleys). When rain falls in a watershed, the water travels over natural and manmade terrain features toward the lowest point. Any area that drains water to one location is a watershed. Watersheds are synonymously called "basins," "catchments," and "drainage areas."

The United States Geological Survey (USGS) has categorized watersheds according to their size, using an address system known as hydrologic unit codes (HUCs). Watersheds are nested, with the drainage of a small creek belonging to the watershed of that creek, as well as the next larger watershed, and the next, continuing all the way to a major river that leads to an ocean. In order to capture this "basin within a basin" characteristic of watersheds, HUCs can describe very specific watersheds, but can be extrapolated to their larger watershed. The fewer the numbers in a HUC, the larger the area it covers. For example, the Upper White River watershed (of which Marion County and Indianapolis are a part) is the HUC-8 watershed (or 8-digit watershed) 05120201. It is part of the Patoka-White River drainage (051202), which is part of the larger Wabash River drainage (0512), which is part of the Ohio River drainage (05).

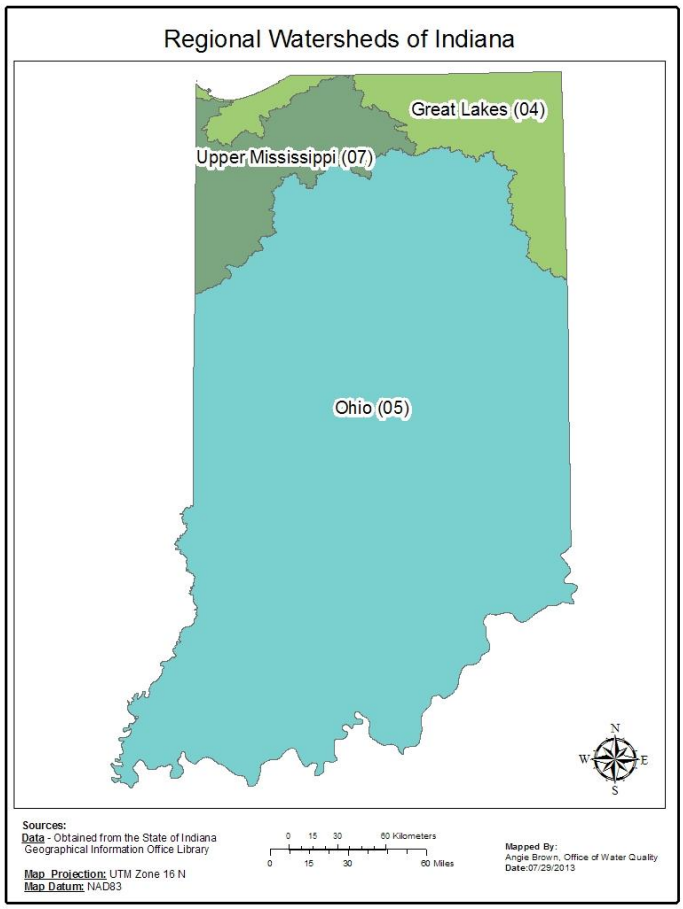

Figure 8. Indiana's 2-digit Watersheds

Indiana's HUCs were first described at the HUC-8, HUC-11, and HUC-14 scales by the USGS Indiana-Kentucky Water Science Center. However, in order to maintain consistency across the nation, Indiana's HUCs have been re-indexed to the HUC-8, HUC-10, and HUC-12 scales. Older maps and documents that depict or discuss watersheds will often describe 11- and 14-digit HUCs, while the newer figures and texts refer to the 10- and 12-digit HUCs. The 12-digit level is the smallest level that is described by HUCs (of which, Indiana has 1589), though watersheds smaller than 12-digits can be defined using software tools and land survey equipment.

The State of Indiana can be divided into three regional watersheds (HUC-2 scale): the Great Lakes (04), Ohio River (05), and the Mississippi River (07) regional watersheds (Figure 8). Over 81.8% of

Indiana drains to the Ohio River, while 9.7% goes to the Great Lakes, and 8.5% goes to the Upper Mississippi River. Indiana wholly or partially contains 38 sub-basins (8-digit HUCs) (Figure 9).

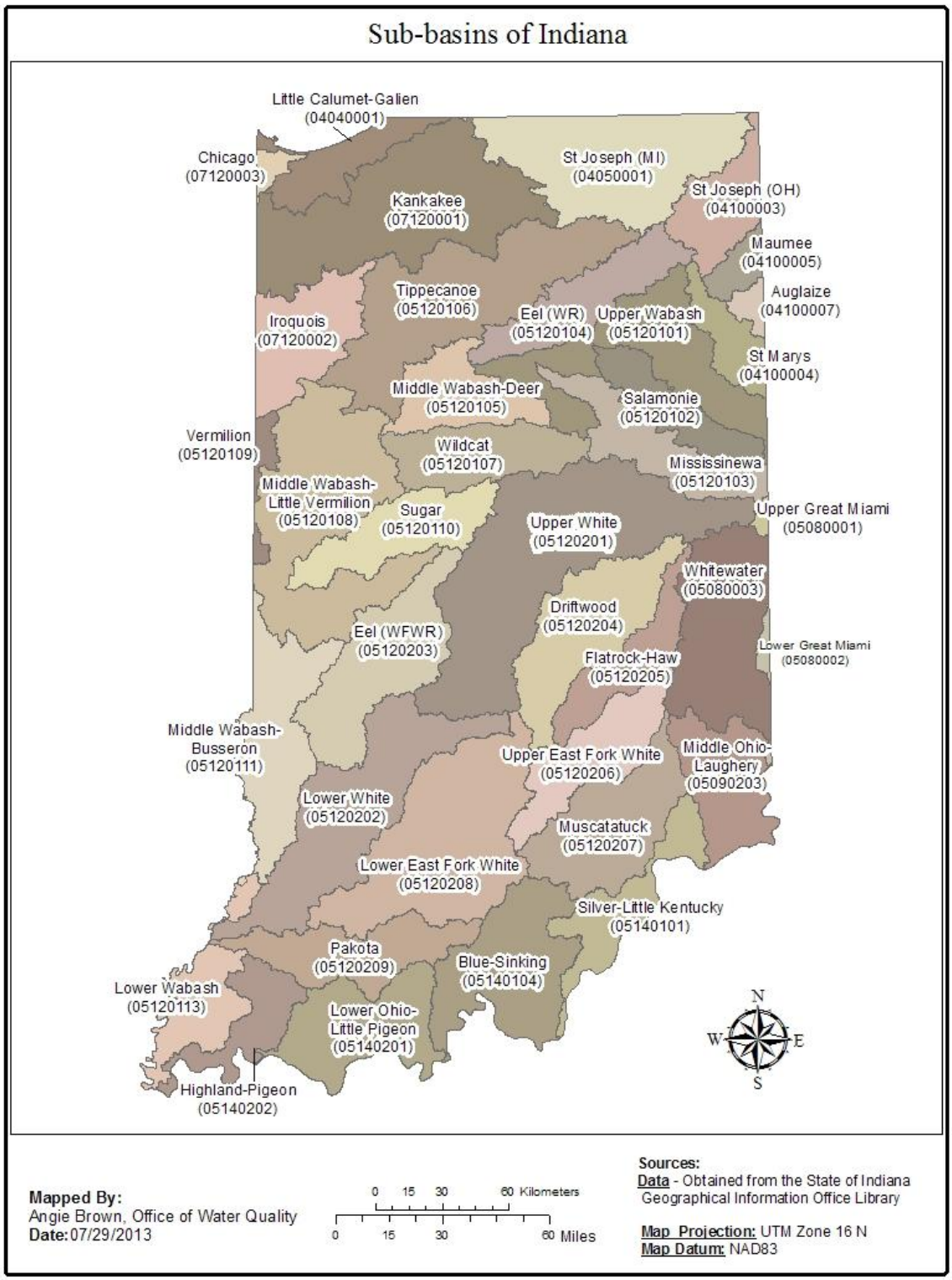

Figure 9. Indiana's 8-digit Watersheds.

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Streams

Indiana contains 63,130 miles of streams and rivers, from headwater agricultural streams to the mighty Wabash (Figure 10). Warm water stream habitats dominate these stream miles, with cold water streams present in the Lake Michigan drainage only. Of these miles at least 81.42% are first and second order ("headwater") streams[3], with drainage areas of less than 5 mi^2 (Ward 2008).

Hydromodification of streams, and of headwater streams in particular, is a major issue in Indiana. Many portions of the state have wet soils that must be drained through ditches and subsurface drainage tiles in order to be farmed. In many instances, natural headwater streams were straightened and channelized in order to send water away from farm fields as fast as possible. In addition, many miles of forested riparian corridor have been removed to reduce the occurrence of in-stream log jams and root intrusion into the tile drainage system[4]. While such hydromodifications have rendered the majority of the state arable, from an ecosystem standpoint, the result has been reduced canopy cover resulting in higher water temperatures; mucky and embedded substrates unsuitable as habitat for many aquatic macroinvertebrates or fish spawning; loss of riffle-pool-run systems; flashy hydrographs; and disconnection with floodplain, resulting in downstream flooding.

While drainage projects have had a profound effect on Indiana's aquatic systems, they are not the only hydromodifications seen in Indiana. Pumping of ground water - both for irrigation and as drinking water for single-family dwellings as well as whole communities-- has effected changes in spring-fed streams. In addition, – lowhead, hydroelectric and flood-control dams, drinking water impoundments, and road crossing culverts have disconnected stream segments and limit the migration of fish and mussel species.

Large Rivers

In Indiana, the Wabash and White Rivers, portions of the St. Joseph (Lake Michigan), Maumee River, and portions of the Kankakee River are "large rivers" (Indiana Biological Survey 2005). Characteristics of the Wabash and White Rivers (whose watersheds comprise the majority of Indiana's drainage) are detailed below.

[3] All Orders (Strahler 1957) of Streams were selected based on 1:100,000 scale of U.S EPA's River Reach File 3. US EPA National Health and Environmental Effects Research Laboratory (NHEERL), Western Ecology Division (WED), Corvallis, Oregon. Data sent by Barbara J. Rosenbaum, contractor to the US EPA NHEERL-WED, to 9 Environmental Scientist IDEM, Office of Water Quality, Assessment Branch, Biological Studies Section. Strahler, A.N. 1957. Quantitative Analysis of Watershed Geomorphology. Trans. Am. Geophys. Un. 38,913-920.

[4] Note that even though a tile drainage system delivers stream discharge through a series of "pipes," any pollutants carried by the discharge would still be considered nonpoint source. This is not to be confused with MS4 discharges, which are point sources, as they are regulated under an NPDES permit.

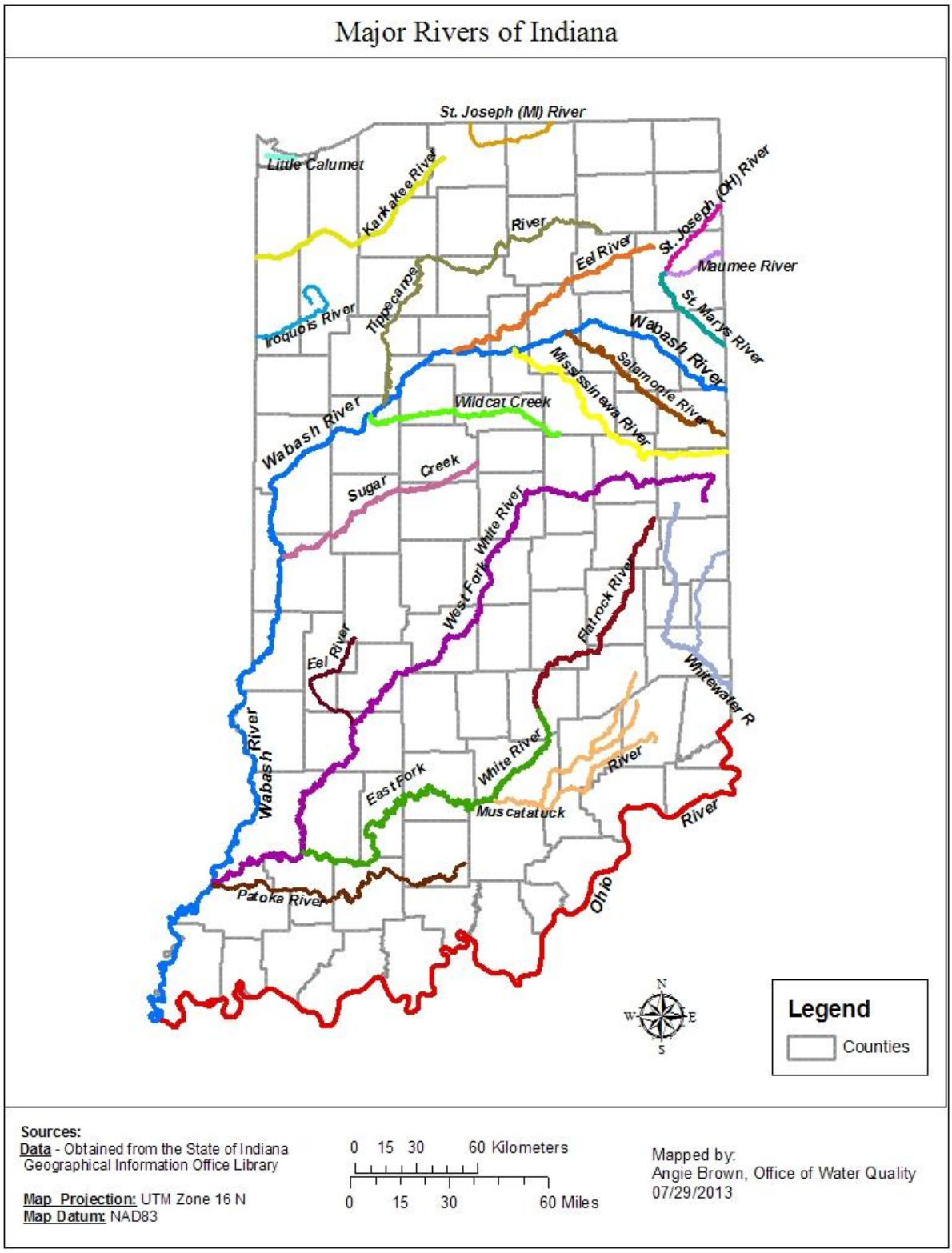

Figure 10. Major Indiana Rivers.

Wabash River

The Wabash River is Indiana's state river and has played a major role in the state's history. Beginning near Ft. Recovery, OH, the river drains 32,910 mi^2 of Indiana, Ohio and Illinois. After flowing for approximately 30 miles in Ohio, the river enters Indiana and flows 61 miles before it is dammed for flood control at the J. Edward Roush Lake, upstream of Huntington, IN. From there, the Wabash River flows unimpeded for 411 miles and is the longest free-flowing river east of the Mississippi River (Karns et al. 2006).

The Wabash River watershed is connected to the Great Lakes watershed in Ohio through Beaver Creek, an outlet of Grand Lake Saint Marys and tributary of the Wabash. However, historically, the main trade route between the Great Lakes and Mississippi River during early European settlement was via the Wabash River through a portage at Ft. Wayne. Though commonly reported as a 7-8 mile portage, the actual passage could vary greatly, according to water levels; during times of intense flooding, travelers could navigate their canoes between the watersheds without portaging. Flood waters still comingle between the basins via Junk Ditch at the site of Eagle Marsh on the south side of Ft. Wayne. Control of the portage was a key reason that the Miami Indians situated their village "Kekionga" near the Three Rivers and why Fort Wayne was established here.

Once Indiana was granted statehood, its leadership embarked on the building of a canal that would connect the Lake Erie tributaries in Ft. Wayne to the Wabash (and ultimately, the Mississippi) River. The result of the project was the historic Wabash and Erie Canal. Between 1832 and 1853 Indiana constructed over 450 miles of canals with the assistance of federal land grants. At 468 miles, the canal connected the Maumee River at Fort Wayne with the Wabash River, then exited the Wabash at Terre Haute and continued south to Evansville by way of the Eel River. This canal system allowed steamboats and flatboats to navigate the traditional trade route much more efficiently. However, the canal soon fell into disuse when the railroad became the preferred method of transporting goods. In 1876 the Wabash and Erie Canal was auctioned off by its trustees; however, remnants of the system remain today, particularly near the Town of Delphi in Carroll County and City of Logansport.

Towns established along the Wabash River in the late 19th and early 20th centuries have always been subject to flooding. A major flood of Peru, Logansport and Lafayette occurred in March 1913; and the Lower Wabash flood of January 1937 was the worst flood to occur in recorded history. These flooding events prompted the United States government to develop a plan for flood control to protect these Wabash riverfront towns. Over the course of several decades, the U.S. Army Corps of Engineers (USACE) devised a plan to construct eight flood-control reservoirs including three in the Upper Wabash River basin (Roush, Salamonie, and Mississinewa), one in the Middle Wabash (Cecil M. Harden Lake), two in the White River watershed (Cagles Mill Lake and Lake Monroe), and one in the Patoka watershed (the aptly named Patoka Lake) (USACE 2011). Today, these reservoirs provide not only flood-control services, but also wildlife habitat, recreational opportunities, and in the Patoka, drinking water.

Despite the anthropogenic alterations to the river, its tributaries, and watershed, the Wabash still has the potential to regain the ecological diversity once present in its waters. The system has the last population of the lake sturgeon in the entire Mississippi River basin. A viable fishery of shovelnose sturgeon is also present in the mainstem. Though unionid mussel diversity has decreased significantly, at least 30 species maintain reproducing populations.

White River

Draining 11,400 mi², the White River is the major tributary of the Wabash River. The White River consists of two forks that flow in a generally southwesterly direction: the East Fork White River and the West Fork White River. The two forks converge northeast of Petersburg, IN and flow for an additional 45 miles as the White River. Altogether, the river flows for a combined 554 miles to its confluence with the Wabash near Mt. Carmel, IL.

The West Fork of the White River begins in a farm field in eastern Randolph County. The river quickly grows in size as it crosses the agricultural landscape as a result of numerous small tributaries in Randolph and eastern Delaware Counties. By the time it reaches the City of Muncie, the White River (along with several wells and tributaries) is large enough to be used as a drinking water source. Muncie is the first of several major urban areas that influence the White River. In

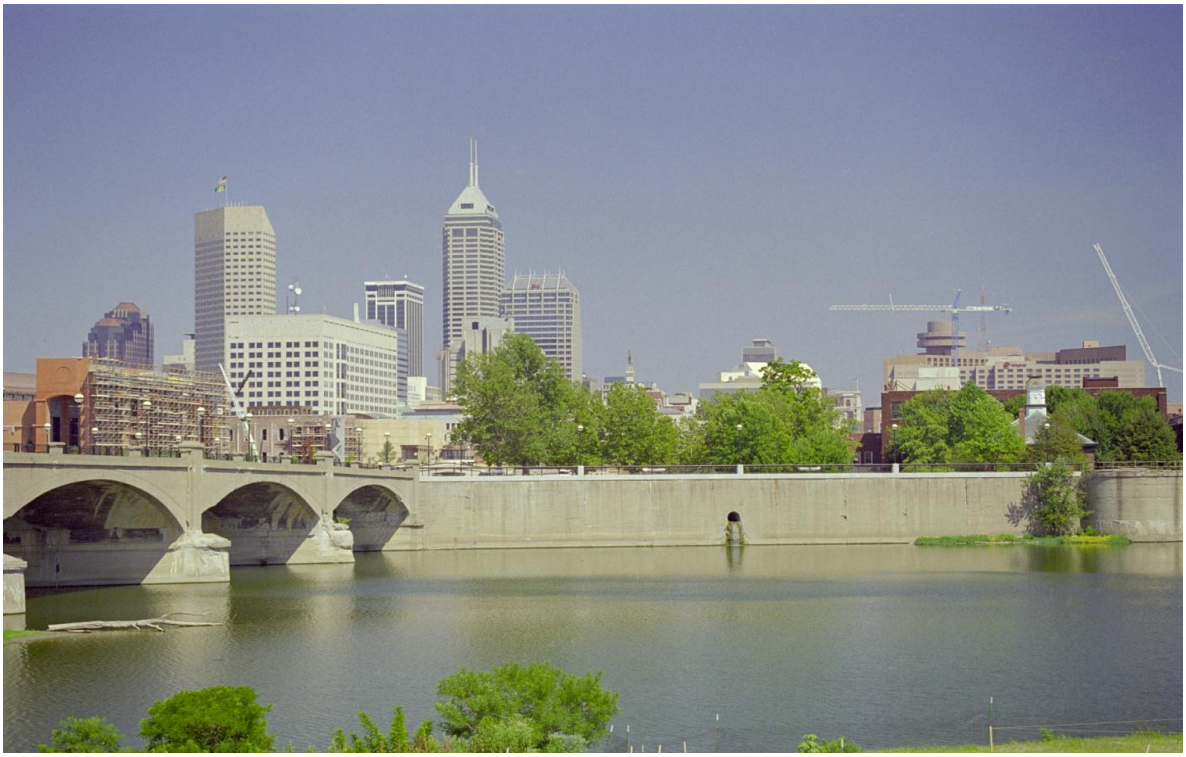

Figure 11. White River through Indianapolis.

the City of Muncie, major efforts have been undertaken by the city to clean up the pollution caused by the releases of numerous factories from the early 20th century. The Muncie Sanitary District's Bureau of Water Quality monitors fish and macroinvertebrate populations in the White River and its Delaware County tributaries to ensure that anthropogenic impacts are not causing additional degradation of the river.

As the West Fork White River progresses on its course through Madison, Hamilton and Marion Counties, it grows larger from the contribution of major tributaries such as Killbuck Creek, Duck Creek, Pipe Creek, Fall Creek, Cicero Creek, Cool Creek, Stony Creek, Eagle Creek, and White Lick Creek, and flows through the Cities of Anderson, Noblesville, Fishers and Carmel into Indianapolis. The White River and its three drinking water reservoirs supply drinking water to the City of Indianapolis. Though urban issues create various pollution issues, such as phosphorus

from lawn fertilization and pathogens from combined sewer overflows (CSOs), recreational use in this section of the river is relatively high, with angling being the most popular form of recreation employed (Hoffman 2005).

After the river leaves Marion County, it is no longer used for drinking water. It enters the more hilly terrain of southern Indiana and the southwestern coal fields before converging with the East Fork.

The East Fork White River begins at the confluence of the Flatrock and Driftwood Rivers in central Indiana near the City of Columbus. As it flows through primarily rural and wild lands, the East Fork is joined by major tributaries such as the Muscatatuck River, Salt Creek, Sand Creek, and Lost River, before confluencing with the West Fork to form the White River. Unlike the West Fork, the East Fork has little in the way of urban influences.

Great Rivers

The Ohio River, forming the southern border of the state, is Indiana's only "great river." The Ohio begins at the confluence of the Allegheny and Monongahela Rivers in Pittsburgh, Pennsylvania and flows 981 miles through six states before emptying into the Mississippi River at Cairo, IL. It is a warm-water, navigable river, with 20 high-lift dams to facilitate commercial shipping.

Despite the fact that it contains 1045 CSO outfalls and over 600 NPDES permitted discharges - including from industry, power-generating facilities, and municipalities – the river serves as a water supply for over 5 million people and as habitat for the federally-endangered pink mucket pearlymussel. Drainage from parts of 15 states (IL, IN, OH, PA, NY, MD, WV, KY, TN, VA, NC, GA, AL, MS & SC) and 203,940 mi^2 flows to the Ohio River. Because it shares drainage with so many states, water quality in the Ohio River is governed through the Ohio River Valley Water Sanitation Commission (ORSANCO), of which Indiana is a part (ORSANCO 2009).

Beyond Indiana: Hypoxia in the Gulf of Mexico

As a contributor to the Mississippi River watershed, Indiana is involved in the Gulf Hypoxia Task Force. This quasi-governmental agency oversees work on the Gulf of Mexico Hypoxia Action Plan, the strategy for reducing and eliminating the annual dead zone in the Gulf of Mexico (Mississippi 2008). The dead zone appears to be the result of a massive yearly algal bloom, brought about by the over-enrichment of waters coming into the Gulf from the Mississippi/Atchafalaya River Basin. One prominent nutrient model (the SPAtially Referenced Regressions On Watershed attributes, or SPARROW model) indicates that Indiana is among several states which are responsible for significant exports of nitrogen and phosphorus to the Gulf. As such, Indiana has prepared and submitted a nutrient reduction strategy to U.S. EPA. This strategy follows guidelines set forth by the Gulf Hypoxia Action Plan which include prioritization of HUC-8 and HUC-12 watersheds; a description of how the state will utilize and coordinate existing resources and programs within those watersheds, seek future funding, and grow and maintain conservation partnerships; a summary of current and future monitoring across the state; and the methods for which accountability will be provided to state and federal agencies, to conservation partners and to the public.

Lakes

Indiana boasts over 1,000 public lakes covering 106,000 acres. The distribution of those lakes includes 452 natural lakes and 580 impoundments (DNR 2012b). Generally, the lakes in the northeastern and north central regions are natural kettle lakes or chains of lakes left over from the glacial period. Also in general, lakes in the central and southern portions of the state tend to be impoundments, though the flood control reservoirs can also be found in northeastern Indiana. Additional impoundments have been established for drinking water storage and recreation.

The majority of Indiana's public lakeshore has been developed. Potential pollutants from developed lakeshores include nutrients from fertilizer, pet waste, and car-washing detergents; sediment from erosion; and *E. coli* from nuisance geese and leaking septic systems.

In recent years, many of Indiana's lakes (both natural and man-made) have been experiencing harmful algal blooms (HABs). It is believed that high levels of phosphorus in addition to other factors are contributing to these freshwater algal blooms.

Great Lakes

Lake Michigan

Indiana's portion of the Lake Michigan shoreline is 59 miles located entirely within the Little Calumet-Galien watershed (HUC 04040001). This 8-digit watershed also roughly[5] corresponds to the area managed under the Coastal Zone Management Act (16 U.S.C. §1451 et seq.) through the IDNR Division of Nature Preserves Lake Michigan Coastal Program (LMCP). At present, all 59 miles of the shoreline in Indiana are listed as impaired for recreational and fishable uses. Several watershed management plans for subwatersheds of the Little Calumet-Galien have been approved (Appendix F), with at least one more under development. Additional water quality-related plans in the area include the Remedial Action Plan (RAP) for the Grand Calumet Area of Concern (AOC) and the Lake Michigan Lakewide Management Plan (LaMP; agreed to in the U.S –Canada Great Lakes Water Quality Agreement of 1987), 41 MS4 entities and associated SWQMPs, and several plans developed for the Indiana Dunes National Lakeshore through the National Park Service.

Indiana's share of Lake Michigan waters includes 154,176 acres of open water. The Indiana waters of Lake Michigan have been assessed for mercury and PCBs in fish tissue in accordance with IDEM's Consolidated Assessment and Listing Methodology (CALM). All 154,176 acres have been impaired for fishable use. Because Lake Michigan is assessed as a single unit, any impairment identified in any part of the lake is applied to all 154,176 acres of Lake Michigan.

In addition to the coastal zone and open waters of Lake Michigan, Indiana shares the St. Joseph River watershed (HUC 04050001), a major tributary to southeastern Lake Michigan, with the State of Michigan. A cooperative watershed management plan was developed for the 8-digit HUC using Michigan 319 funds, and is being implemented by partners in both states. Several smaller WMPs have been developed in both states, implemented by local groups.

[5] The Program Boundary is based on the Historic Little Calumet Galien Watershed. This watershed includes the Chicago Diversion. The Program Boundary is squared off using township boundaries and the associated county roads. As such, some portions of the watershed are outside the Program Boundary and some areas outside the watershed are included in the Program Boundary.

Lake Erie

Though Indiana cannot claim to have Lake Erie lakefront real estate, the state does contribute drainage area to the Maumee River, the largest tributary to the Western Lake Erie Basin. Formed from the confluence of the St. Joseph (Lake Erie) and St. Marys Rivers, the Maumee flows eastward out of the City of Ft. Wayne, through Ohio, to Lake Erie. The watershed is predominantly agricultural, though the river itself runs through several urban areas (Ft. Wayne and New Haven in Indiana, as well as Defiance and Toledo in Ohio). Since 2003, a large plume of sediment and algae coming into the lake through Maumee Bay has been observable via satellite images. Several partnerships, including the Western Lake Erie Basin (WLEB) Partnership, the St. Joseph River Watershed Initiative, the Upper Maumee Watershed Partnership, and the Maumee River Basin Partnership of Local Governments are working to improve water quality in the tributaries that lead to Maumee Bay. At the state level, ISDA actively participates in the WLEB Partnership and offers technical assistance to landowners to reduce nutrient loss in the watershed. IDEM has and continues to provide funding for watershed groups working in this area to reduce NPS to the Lake.

<u>Wetlands</u>

Wetlands are present in every county in Indiana. The best estimate of the wetlands in Indiana prior to European settlement is based on the presence of hydric soils (soils that form under saturated, flooded, or ponded conditions). Mapping of soils is conducted by the USDA Natural Resource Conservation Service, or NRCS (formerly the Soil Conservation Service or SCS). Based on an analysis of this data by the IDNR, it is believed there were approximately 5.6 million acres of wetlands in Indiana 200 years ago.

The value of wetlands, including wetland functions with economic impacts such as flood control, pollutant attenuation, and wildlife habitat, has not always been appreciated in Indiana. One historical bulletin issued from by the Indiana Bureau of Legislative Information in 1914 indicated that 625,000 acres stood to be "reclaimed" (i.e. drained) in Indiana at that time. Significant pre-settlement wetlands that existed as part of the Kankakee Grand Marsh in northwestern Indiana and the Great Black Swamp in northeastern Indiana were drained in order to exploit the prime farmland beneath the waters. Additional wetland acreage has been filled to allow for development and agriculture. Bogs are mined for peat, a horticultural amendment. Today, an estimated 863,000 acres of wetland remain in Indiana.

The nation's wetlands were mapped beginning in the 1970s by the U.S. Fish and Wildlife Service (USFWS) as part of the National Wetlands Inventory (NWI). Advances in remote sensing and Geographic Information System (GIS) technologies have been made since the state's wetlands were originally tallied as part of the NWI in 1985. IDEM contracted with Ducks Unlimited to update the NWI maps for Indiana in 2007. The project was completed in 2009. A total of 174,204 acres of emergent, 658,205 acres of forested/scrub-shrub, and 30,551 acres of lacustrine wetland were identified. Of the identified wetlands, 59% are under an acre in size.

Change in wetland acreage since the last NWI was completed suggests that some wetlands were converted to other uses over the intervening years. The analysis indicated that 45,415.96 acres were converted to other uses between the date of the original NWI (ca. 1980-1988) and the update year (ca. 2005). Approximately 72% were converted for agriculture purposes and nearly 24% for development (the remaining 4% of wetland conversions were categorized as recreational and

"other"). Additionally, the report found that emergent wetlands occupied the greatest converted acreage (48%), with forested wetlands a close second (32%). Ditched and/or excavated wetlands accounted for 117,099 acres; while farmed wetlands totaled only 2,215 acres.

Combining the information from the National Wetlands Inventory (NWI) and the IDNR yields the following summary:

- Estimated wetlands circa 1780s: 5,600,000 acres
- Percent of surface area in wetlands circa 1780s: 24.1%
- Existing wetlands: 862,960 acres
- Percent of surface area in wetlands today: 3.5 %
- Percent of wetlands lost: 85%

The country's attitude toward wetlands shifted in the 1970s, evidenced by President Jimmy Carter's Executive Order 11990, which required federal programs to avoid wetland loss when possible. Later, the 1985 Farm Bill would include a "Swampbuster" provision (16 U.S.C. §§3801-3823) to discourage more wetland loss due to agriculture. President George H. W. Bush set a national policy of "No Net Loss" (of wetlands) in 1989, paving the way for compensatory wetland mitigations for drained or filled wetlands. Today, in Indiana, IDEM and the USACE permit wetland and riparian impacts requiring mitigation. Many groups throughout the state are preserving and restoring wetlands through Farm Bill programs, state monies, and private funding. Wetland restorations with notable state involvement include the Limberlost-Loblolly Swamp in Jay County, Goose Pond Fish and Wildlife Area in Greene County, the Healthy Rivers Initiative (including wetlands in the floodplains and bottomlands of Sugar Creek, Wabash River, and Muscatatuck River), Grand Kankakee Marsh (500,000 acres in eight northwestern Indiana counties), Jasper-Pulaski Fish and Wildlife Area (in Jasper and Pulaski Counties), Wabashiki Fish and Wildlife Area (Vigo County), and numerous smaller tracts dedicated as State Nature Preserves. In addition, several land trusts and conservancies are protecting wetland acres across the state.

<u>Ground water</u>

Ground water is water that resides in aquifers, underground geologic formations that are capable of producing water through a well. Ground water doesn't "flow" (like a river or stream) so much as it slowly migrates through sediments and fissures in bedrock until an equilibrium is reached. Ground water in the northern 2/3 of Indiana is typically found in sand and gravel of the glacial deposits and is generally plentiful. More than 300,000 public and private wells provide water for drinking and industrial uses in Indiana.

Given the absence of glaciers, and therefore the unconsolidated materials they generated, in southern Indiana, ground water is much scarcer. In addition, some portions of southern Indiana have karst landscapes that bypass the natural filtering capacity of soil, and send water from the surface to deep underground through caverns and tunnels. Ground water in karst landscapes is very susceptible to pollution because there is no chance to filter the water through a soil layer before it permeates into bedrock. The solution to this ground water scarcity has been to build drinking water reservoirs, such as Lake Monroe near Bloomington, and Patoka Lake near Jasper.

Despite the widespread use of ground water as drinking water in Indiana, this source water receives less attention from the NPS program than surface water. Significant NPS threats to ground water include:

- Nitrates
- Bacteria and other pathogens
- Arsenic (naturally occurring)
- Pesticides
- Improper abandonment of wells
- Dumping to quarries, mines, and karst features

Considerable opportunities exist to coordinate the NPS program with IDEM's Ground Water (GW) Section to identify communities with source water intakes that do not have a watershed management plan and encourage the creation of a source water implementation plan. In addition, the GW Section has initiated a project to rank wellhead protection areas on the risk of contamination and target those high-ranking communities for additional technical assistance. Long-term, the Section is interested in using a tool that can predict ground water recharge and discharge areas of the state to better predict the magnitude of the risk of particular aquifers to contamination. Other states have programs that the GW Section is interested in emulating, including the ground water management zones in Oregon and the ground water-enhanced super gages in Montana.

Water Quality

Ambient surface water quality standards for the State of Indiana are found in Title 327 of the Indiana Administrative Code. 327 IAC 2-1-1.5 defines the water quality goal of the state: "to restore and maintain the chemical, physical, and biological integrity of the waters of the state." All waters in Indiana are designated for one or more beneficial uses in the state's water quality standards, which also contain numeric and narrative criteria to protect their water quality. These criteria are used to determine whether a waterbody is "fully supporting" the designated use or if the use is impaired. Beneficial uses take into consideration the use and value of the water as a public water supply, as habitat for the protection of aquatic wildlife, and as a source for recreation, industry and agriculture uses.

Unless otherwise noted in the IAC, all of Indiana's waters are designated for full-body contact recreation and warm water aquatic life use (327 IAC 2-1-3 and 327 IAC 2-1.5-5). In the Great Lakes, waters that meet the ecological conditions for salmonid reproduction and put-and-take trout fishing should also, by rule, maintain those conditions (327 IAC 2-1.5-5). The state also designates waters for public and industrial water supply, agriculture, and fish and wildlife uses, but generally, if a waterbody meets the water quality criteria for both the full-body contact and aquatic life use designation, it will meet the criteria for the remaining uses.

Every two years (in even-numbered years), Indiana submits to U.S. EPA the *Integrated Water Quality Monitoring and Assessment Report* (also known as the Integrated Report or IR). The IR describes the state of water quality in Indiana. Each waterbody for which data are available is assessed according to whether or not it meets the minimum water quality criteria for aquatic life use and human health, which includes full-body contact recreation and fish consumption. The 2012 IR included the following summary of surface water quality conditions in Indiana:

Designated Beneficial Use	Total Size	Size Assessed	Size Fully Supporting	Size Not Supporting[6]	Size Not Attainable
River (Miles)					
Full Body Contact (Recreational Use)	42,411	20,804	4,776	16,027	0
Human Health and Wildlife (Fishable Use)	42,331	5,866	1,213	4,653	0
Public Water Supply	117	1	0	1	0
Warm Water Aquatic Life (Aquatic Life Use)	42,320	24,232	17,461	6,771	31
Lake Michigan Shoreline (Miles)					
Full Body Contact (Recreational Use)	67	67	5	62	0
Human Health and Wildlife (Fishable Use)	67	67	0	67	0
Public Water Supply	35	35	35	0	0
Warm Water Aquatic Life (Aquatic Life Use)	67	67	62	5	0
Lake Michigan (Acres)					
Human Health and Wildlife (Fishable Use)	154,176	154,176	0	154,176	0
Lakes and Reservoirs (Acres)					
Full Body Contact (Recreational Use)	122,303	31,805	26%	23,799	8,006
Human Health and Wildlife (Fishable Use)	122,303	66,247	54%	7,820	58,427
Public Water Supply	29,541	16,615	56%	230	16,385
Warm Water Aquatic Life (Aquatic Life Use)	122,303	10,315	8%	3,690	6,625

Table 3. Assessment of monitored stream and lake miles in Indiana. From Indiana's 2012 Integrated Water Monitoring and Assessment Report. Note: "Not Supporting" indicates that the waterbody is capable of supporting the designated use, but is currently impaired due to one or more causes. "Size Not Attainable" designations include limited use waters whose natural low-flow condition renders them unable to support warm water aquatic life during much of the year.

[6] Note that the numbers in Table 3 are not cumulative since a given waterbody can be impaired for one or more uses. For example, if the same stream is impaired for both recreational use and fish consumption, its mileage would be reported in this table for each use. So, if the numbers for each use are added together, the number of impaired miles will be artificially inflated.

The Integrated Report also contains a Consolidated List of all the waters of the state. Each waterbody is placed into a category for each of its designated uses depending on the degree to which it supports that use:

- Category 1: The waterbody is fully supporting all of its designated uses and none of its uses are threatened.

- Category 2: The waterbody is fully supporting the designated use assessed and no other use is threatened; insufficient data and information are available to determine if the remaining uses are supported or threatened.

- Category 3: Insufficient data and information are available to determine if the waterbody is supporting its designated use.

- Category 4: The designated use is impaired or threatened but a total maximum daily load (TMDL) is not required because:

    a. A TMDL has already been completed for the impairment(s) and approved by U.S. EPA and is expected to result in attainment of all applicable water quality standards; or
    b. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in a reasonable period of time; or,
    c. The impairment is not caused by a pollutant.

- Category 5: The designated use is impaired, and a TMDL is required because:

    a. The aquatic life use, recreational use, or drinking water use is impaired or threatened by one or more pollutant; or
    b. The concentration of mercury or PCBs in the edible tissue of fish collected from the waterbody exceeds Indiana's human health criteria for these contaminants.

The 303(d) list is comprised of the Category 5 waters on Indiana's Consolidated List and is included as an appendix to the IR. Category 5 waters may be impaired by point sources or nonpoint sources. If the cause and source of the impairment is determined to be driven by point sources, permits are revisited to remedy the impairment. If the impairment is driven by nonpoint source pollution, the waterbody is eligible for watershed planning and implementation through IDEM's Nonpoint Source program. In either case, the state may need to prepare a TMDL for the impaired waterbody.

<u>TMDLs</u>

TMDL reports are assessments of water quality in rivers, lakes, and streams where impairments exist. The report is mandated through CWA Section 303(d), and contains an overview of the waterbodies, the sources of pollutants, the methods used to analyze data, reductions in levels of pollutants needed to restore water quality, actions that need to be taken to reduce pollutant levels, and actions that are being taken to improve water quality. Currently, Indiana's TMDLs are written on a watershed basis. In 2011, IDEM completed a project to create a TMDL template that meets the U.S. EPA's 9 Elements of a Watershed based Plan. FFY 2013 was the first year in which this template was applied to TMDLs in Indiana.

Prior to FFY 2013, IDEM did not use Section 319 funding to develop TMDLs (including monitoring or staff time). However, with completion of the TMDL/WMP Template, TMDLs are being written to increase TMDL/NPS program integration and efficiency, include an implementation focus to align with current program needs. The opportunity exists to utilize 319 funding for TMDL development and implementation, with the acknowledgement that local adaptation may be necessary. Indiana will continue program assessment to determine whether or not NPS TMDLs will be written using NPS funds.

Regulatory Actions to Control Nonpoint Source

NPDES Permits

Facilities and industries that discharge effluent to surface water bodies of the state must apply for and receive a permit under the NPDES Permit Compliance Program (CWA 308, 327 IAC 5, et seq.), housed in the IDEM Office of Water Quality (OWQ). This also applies to storm water discharges as defined under 327 IAC 15-5, 15-6 and 15-13 (respectively, Rule 5 – Storm Water Run-off Associated with Construction Activity; Rule 6 – Storm Water Discharges Exposed to Industrial Activity; and Rule 13 – Storm Water Run-off Associated with Municipal Separate Storm Sewer System Conveyance) and discharges associated with concentrated animal feeding operations (CAFO) in accordance with 327 IAC 15-16. The NPDES permitting area coordinates regulatory compliance activities with the Office of Enforcement and the Office of Voluntary Compliance (Office of Pollution Prevention and Technical Assistance), as well as informs the public, private sector, and regulated community about strategies to achieve regulatory compliance. Section 319 funds cannot be used to meet permit requirements. Permitted sources are only eligible to receive Section 319 funding from the state if the project is "above and beyond" the conditions of the sponsor's state or federal permit.

Section 401 Water Quality Certifications

IDEM regulates activities in lakes, rivers, streams and wetlands to ensure that those activities maintain the chemical, physical, and biological integrity of these waters. Our nation's wetlands and waterways provide beautiful scenery, drinking water/ground water recharge, and recreation value, along with many other benefits. They also provide raw materials for industry and medicine, hydroelectric power, a receptacle for wastewater, and a highway for commerce. While these uses provide great benefits to citizens, they can also alter and pollute our nation's waters and waterways. Federal permits or licenses are required to conduct many of these types of operations, including building and operating hydroelectric dams, discharging wastewater, altering flow paths, and placing fill materials into wetlands and waterways.

When a project is planned in Indiana that will impact a wetland, stream, river, lake, or other Water of the U.S., that project must apply for a Section 401 Water Quality Certification (401 WQC) from IDEM before the planned water quality impacts commence. A Section 401 WQC is a required component of a federal permit and must be obtained before a federal permit or license can be granted.

Non-Regulatory Actions to Control Nonpoint Source

Watershed Management Plans

Most actions to reduce and prevent nonpoint source pollution in Indiana are voluntary actions. Local "watershed groups" can be anything from an ad-hoc group of stakeholders meeting together to strategize about their water quality issues to incorporated 501(c)(3) non-profit groups. When watershed groups come together to create a program to address NPS in a local watershed, they often start with writing a watershed management plan (WMP). A WMP is a strategy and a work plan for achieving water resource goals that provides assessment and management information for a geographically defined watershed. It includes the analyses, actions, participants, and resources related to development and implementation of the plan. The watershed planning process uses a series of cooperative, iterative steps to characterize existing conditions, identify and prioritize problems, define management objectives, and develop and implement protection or remediation strategies as necessary.

The main components (or chapters) in a watershed management plan include:

- Public Concerns
- Watershed Inventory - includes water quality, physical, and social data
- Problem Identification
- Identification of Sources of Problems
- Selection of Critical Areas
- Goals and Objectives
- Methods to Measure Success

CWA Section 319 or 205j funds can be used to hire additional staff that may be required to produce a WMP. WMPs in Indiana are approved using the 2009 Indiana Watershed Management Plan Checklist (Appendix E). Approved WMPs are then eligible to receive 319 implementation funding. Indiana currently has 97 approved WMPs (Appendix F).

Section 319 funding may be used to implement best management practices identified in a WMP, but many different sources of funding exist for water quality improvement projects. The "Funding Mechanisms" section (page 83) provides further details on implementation funding available for watershed implementation projects in Indiana.

Monitoring

Monitoring for water quality is a primary responsibility of the IDEM Office of Water Quality. The Office monitors for ambient water quality information (including ground water and surface water); potential permit violations; baseline watershed characterization; to support the development of public health advisories (such as fish consumption advisories and beach closures); identify trends in water quality improvement/degradation; to develop water quality criteria, to set permit limits and environmental indicators; identify impacts to beneficial uses; and to respond to citizen concerns. The State's full water quality monitoring strategy is described in the *Indiana Water Quality Monitoring Strategy 2011-2019.* However, only those monitoring activities related to NPS programming will be included in this document.

Nonpoint Source Monitoring Strategy

Indiana's NPS monitoring strategy has been evolving since it was first completed and submitted to U.S. EPA in late 2009. At that time, IDEM's monitoring staff and NPS program staff were organizationally and spatially separated into IDEM's Assessment Branch (monitoring staff) and the Watershed Planning Branch (NPS staff), and resided in different physical locations, making coordination between the programs somewhat difficult. In early 2010, IDEM combined these branches to more effectively utilize resources. Also in 2010, the newly created "Watershed Assessment and Planning Branch" embarked upon revising the water quality monitoring strategy (WQMS) for the state. NPS monitoring issues were incorporated into the updated WQMS and new programs commenced in the 2011 sampling season. Essential NPS Monitoring Strategy components retained in the new WQMS can be grouped under three broad topics and are summarized below. Additional information on each of these programs is available in the *Indiana WQMS 2011-2019*, the 2012-2017 *IDEM Quality Management Plan (QMP),* and internal project work plans.

1. Baseline Monitoring for Watershed Characterization Leading to the Formulation of a Watershed Management Plan

Watershed management plans funded through Section 319 grants to local watershed groups and other organizations must:

- Identify the causes of impairment within their watershed(s), the sources and/or stressors driving them, and the load reductions or other activities needed to control them.
- Identify and prioritize the critical areas in need of implementation measures to reduce nonpoint source pollution.
- Include a monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against a set of defined criteria that can be used to determine whether loading reductions are being achieved and whether progress is being made toward attaining water quality standards.

Watershed groups and other organizations participating in watershed planning and restoration activities may use data from any source, including but not limited to data collected by IDEM. Watershed groups commonly conduct their own monitoring. Watershed groups typically use the most scientifically rigorous sampling and analytical methods their expertise and budget will allow, which can vary significantly from watershed group to watershed group. To provide additional support to watershed management planning activities, OWQ has chosen to conduct monitoring for a limited number of watershed groups each funding year. IDEM will provide this monitoring to either augment the monitoring to be conducted by the group under an approved Quality Assurance Project Plan (QAPP) or in lieu of the group conducting its own monitoring.

This monitoring will provide a valid baseline for later determining if improvements in water quality have been achieved as a result of any best management practices implemented in the watershed, which may help IDEM to meet some of the performance measures described in the following section.

IDEM is in the process of refining its selection criteria for baseline monitoring project assistance. The selection of watersheds chosen for monitoring assistance in 2011 & 2012 was based on the following criteria:

- The project selected is a new proposal for the funding cycle and does not yet have a monitoring program in place to support its planning activities.
- The project ranked highly in the proposal selection process and had already been selected for funding. The project selected needed the monitoring assistance more than other projects slated for funding, which already have the necessary capacity to conduct their own monitoring.

In 2013, IDEM included the additional criterion that the project must be in an area slated for a TMDL. IDEM continues to evaluate the baseline monitoring program for efficiencies and opportunities to utilize data for multiple programmatic needs.

OWQ has not yet determined all the methods that will be used to analyze the data collected through the new baseline monitoring activities. In order to know the level of assistance watershed groups will need in best utilizing these data, OWQ has developed a process for early and ongoing coordination with the groups for whom baseline monitoring is conducted to ensure that the study will meet their needs, to determine the types of data analysis they need and whether they have the capacity to do this work. As a part of this ongoing coordination, local watershed coordinators have been invited to participate in the 305(b) assessment process in order to enhance the planning process by helping them to better understand how IDEM evaluates the data and determines potential sources. In addition, it has been suggested that IDEM use water quality information collected as part of baseline projects to create "water quality report cards." This approach will be piloted in Deep River in 2014 or 2015.

2. Identify Water Quality Improvements Accomplished by Watershed Restoration Efforts Funded Through Clean Water Act Programs

This monitoring objective comes from the National Water Program Guidance issued by U.S. EPA (U.S. EPA 2012b), which defines the measures to be used to assess progress in meeting the goals outlined in its Strategic Plan. This guidance contains both administrative and environmental performance measures for many of IDEM's CWA programs. IDEM's WQMS addresses those measures which require water quality monitoring data.

WQ-10 (or "Nonpoint Source Success Stories") – This performance measure requires that states develop "NPS Success Stories" and submit them to U.S. EPA for the purposes of tracking how NPS restoration efforts are improving water quality. To meet this measure, IDEM must identify nonpoint source-impaired waters that have been improved as a result of watershed restoration efforts funded in part or whole by IDEM's Nonpoint Source Program.

SP 12 (or "Measure W") – This measure requires that OWQ show improvements in water quality conditions in impaired watersheds that have resulted from watershed planning and restoration activities. For the purposes of meeting this performance measure, improvements may be demonstrated by the delisting of at least 40 percent of the impairments or impaired miles/acres in the watershed or valid scientific information that indicates significant

watershed-wide improvement in one or more water quality parameters associated with the impairments listed in 2002.

Both of these U.S. EPA performance measures involve identifying where water quality improvements are occurring, either as a result of OWQ grant funded watershed planning and restoration efforts or for other reasons. To meet this monitoring objective, OWQ must conduct targeted monitoring of waters previously identified as impaired on Indiana's 303(d) list, with an emphasis on those watersheds where restoration efforts are known to have occurred.

3. Lakes Monitoring

The Indiana Clean Lakes Program (CLP) is administered for IDEM by the Indiana University School of Public and Environmental Affairs (IU/SPEA) through a Section 319 grant from OWQ's Nonpoint Source Program and includes two primary but different monitoring components. IU/SPEA staff and students conduct the majority of the monitoring for the CLP and administer a volunteer monitoring program through which additional monitoring is conducted by a corps of trained citizen volunteers.

Lakes monitored by IU/SPEA are selected for sampling from a population of approximately 400 lakes and reservoirs throughout Indiana which are greater than five acres in surface area and which have a publicly accessible boat launching area. IU/SPEA samples approximately 80 lakes per year, and volunteers monitor approximately 100 more annually. The program uses a randomized sampling approach to select lakes from this population to monitor in order to explore additional statistical assessment methods for lakes.

In addition, several monitoring programs that are currently funded through sources other than 319 may be funded by Section 319 in the future. These include, but are not limited to, the following:

- Monitoring to Support Total Maximum Daily Load Development
- Monitoring to Support Development of Public Health Advisories
- Special Studies
- Ground water Monitoring
- Monitoring to Support the National Water Quality Initiative

Generally, OWQ's targeted monitoring approaches are designed to meet specific needs but are leveraged where possible to meet multiple water monitoring objectives. Sites and study areas are specifically selected based on known impairments, historical information, permitted dischargers, land use, watershed group focus areas, and other factors relevant to the monitoring objective for which the monitoring is to be conducted. Sampling projects and sites change annually and may occur anywhere in the state, depending on specific monitoring objectives. The targeted monitoring design allows for gathering a variety of biotic and abiotic information including bacteriological, fish and macroinvertebrate community measures, fish and sediment contaminant levels, in-stream and riparian habitat measures, and physical and chemical water chemistry parameters.

Environmental Indicators Collected by 319 Projects

In addition to data collected by IDEM, some watershed interest groups have the budget and expertise to conduct their own water quality monitoring programs. These groups have requested guidance from the NPS program as to the types of information that is important to collect, as well as the appropriate methods to be used. In response to this need, IDEM partnered with Purdue University on a project to produce a manual for watershed groups collecting water quality data. The result of that project was the *Monitoring Water in Indiana: Choices for Nonpoint Source and Other Watershed Projects* handbook which lays out basic information on important NPS parameters and biological indices, identifies core and supplemental indicators, suggests targets and protective levels, and provides information on photomonitoring. In addition it identifies methodologies used by the main water quality agencies in the state, including IDEM, IDNR- Lake and River Enhancement (LARE), USFWS, and USGS so that groups can choose to use methods comparable to larger datasets in the state.

Hoosier Riverwatch Program

Hoosier Riverwatch is a program of the IDEM, Watershed Assessment and Planning Branch. The program began in Indiana to increase public awareness of water quality issues and concerns by training volunteers to monitor stream water quality. The mission of Hoosier Riverwatch is to involve the citizens of Indiana in becoming active stewards of Indiana's water resources through watershed education, water monitoring, and clean-up activities. Hoosier Riverwatch accomplishes this mission through the following goals:

- Educate citizens on watersheds and the relationship between land use and water quality.
- Train citizens on the basic principles of water quality monitoring.
- Promote opportunities for involvement in water quality issues.
- Provide water quality information to individuals or groups working to protect water resources.
- Support volunteer efforts through technical assistance, monitoring equipment, networking opportunities, and educational materials.

Prior to November 2012, Hoosier Riverwatch was a program within the IDNR where it was supported by a federal Sport Fish Restoration grant and State funding. The move to IDEM better integrates the volunteer water monitoring program into watershed monitoring and planning activities, and it is now 319-funded. Many watershed groups without large budgets or technical resources utilize Hoosier Riverwatch to monitor their watersheds.

QAPPs

Any monitoring data collection (including the collation of data collected by third parties) funded through IDEM's Nonpoint Source Program must be conducted under a QAPP approved by the NPS Program prior to initiation of monitoring activities. QAPPs ensure that the data collected are the data needed to meet water quality objectives. QAPPs also lay out the sampling sites, protocols, and QA/QC measures that will be employed throughout the sampling program. More information related to QAPP requirements is available at http://www.in.gov/idem/nps/3383.htm.

Management of Nonpoint Source Grant Project Data and Data Submitted through the Office of Water Quality's External Data Framework

The IDEM Assessment Information Management System (AIMS) database includes the ability to integrate nonpoint source monitoring data collected by external organizations for projects funded

through IDEM's NPS Program and others interested in submitting their data through the External Data Framework (EDF) when implemented. The EDF, which is currently under development, will guide IDEM's use of data submitted by external partners for the purposes of 305(b) water quality assessment.

While many of the external sources of information may be from volunteer or other monitoring professionals, the ability to integrate data from multiple sources will allow OWQ to better support internal and external data requests by providing a more comprehensive set of data, which is accurately characterized in terms of its data quality and appropriateness for various uses. In addition to storing water quality data collected by nonpoint source project and other external partners, AIMSII also supports watershed planning and implementation efforts with its ability to store modeled results for load reduction estimates based on specific types of best management practices. The ability to store this type of information provides a single location for retrieving both nonpoint source data and data collected by the WAPB for the purposes of analyzing modeled load reductions and water quality data together.

The new NPS function of AIMS supports the internal data management needs associated with the EDF and serves as an important component of the guidance that external organizations can receive. The templates developed for the submission of data from grant funded NPS program projects can also be used by external organizations who wish to provide their water quality data to IDEM. The templates will help participating organizations to standardize their project metadata, which describes the data they collect, and their water quality data for submission through the EDF. Providing such documentation will help external organizations ensure that the data they collect are of known quality, enhancing the usability of the data and creating new opportunities for collaboration.

Modeling

While monitoring water quality conditions is an approach taken by IDEM and many local watershed groups to characterize problems, causes, and source of NPS, modeling is another way to approximate conditions in a given watershed. Models require data of some type – be it water quality data or land use data. Many models have been, and continue to be, produced for use by water quality practitioners. Common models utilized by groups in Indiana include the Long-term Hydrologic Impact Analysis tool (L-THIA), the Spreadsheet Tool for the Estimation of Pollutant Load (STEP-L), and the Soil and Water Assessment Tool (SWAT). Many additional models are available for cases in which the aforementioned tools are not well-suited.

Inventory of Stakeholders

Legal Framework Renders all Citizens Stakeholders Relative to NPS

The Indiana Code legally defines water in a natural stream or lake as a public trust resource – property of the citizenry held in trust by the State (IC 14-25-1-2). To further paraphrase, the State is designated as the primary caretaker of water resources, acting on behalf of citizens and making determinations to protect the natural resource for future generations. Although the State protects Indiana's water resources, each Indiana resident is made a stakeholder in the quality of their water resources, whether it is for economic, recreational, or consumptive uses.

> **IC 14-25-1-2**
> **Waters declared natural resource**
> Sec. 2. (a) Water in a natural stream, natural lake, or another natural body of water in Indiana that may be applied to a useful and beneficial purpose is declared to be:
> (1) a natural resource and public water of Indiana; and
> (2) subject to control and regulation for the public welfare as determined by the general assembly.

IDEM is the agency designated by the State to administer the federal programs stemming from the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA), which gives them broad authority to act on behalf of citizens to reduce water pollution, including Nonpoint Source Pollution. While the CWA and SDWA provide federal and state authority for protecting water quality, the state of Indiana has also put into place a legal framework whereby state agencies - IDEM as well as other agencies, such as the Office of the Indiana State Chemist (OISC) – can control nonpoint sources and protect water quality. Additional water-related functions fall under the jurisdiction of IDEM's sister and partner agencies, such as Soil and Water Conservation Districts (SWCDs), the Indiana State Department of Health (ISDH), the Indiana Department of Natural Resources (DNR), and Purdue Extension.

The Indiana Code itself empowers IDEM to protect Indiana from sources of pollution through a variety of avenues. More specifically, the Environmental Rules Board (ERB) has been established to adopt rules and promulgate those adopted rules to abate pollution. The State retains the authority to broadly interpret the IC in its protection of water resources. For example, IC 13-18-4-5 states that "a person may not throw, run, drain, or otherwise dispose; or cause, permit, or suffer to be thrown, run, drained, allowed to seep, or otherwise disposed; into any of the streams or waters of Indiana any organic or inorganic matter that causes or contributes to a polluted condition of any of the streams or waters of Indiana…" The Indiana Attorney General has suggested that this Act protects State water resources from pollution regardless of the activity from which it was created, including NPS sources.

The ERB is also tasked in the Indiana Code to establish the requirements for issuing permits, with IDEM establishing the guidelines for compliance and reporting (IC 13-15-1-2). While the majority of these permits regulate point source discharges, the NPS program works in partnership with most of these programs in their effort to eliminate NPS, including the programs for storm water, drinking water, wetlands, and confined animal feeding, among others. The individual state programs established by Federal and State Acts are integral to protecting Indiana's water resources, and perform as important internal partners to the State NPS Program.

Internal IDEM Program Partners

The NPS Program is integral to the mission of improving water quality in Indiana, but it acts only as a part of several integral IDEM programs that work in parallel to enhance the resource. The NPS program staff work to engage these other agency program when working with external partners and look to create efficiencies in their efforts to reduce NPS sources. Each internal partner brings a different piece to the puzzle that is holistic NPS reduction. In no particular order, the internal IDEM partners that assist the NPS program are:

- Storm Water Program
- Wetlands Program
- Enforcement Program
- TMDL Program
- Monitoring & Assessment Programs
- Hoosier Riverwatch Volunteer Monitoring Program
- Brownfield Program
- Confined Feeding Program
- GW/Drinking Water Program

The NPS program works with these partners through attendance at their annual conferences, information-sharing and coordination meetings, technical assistance, invitations to speak with local watershed groups on a variety of projects, and the resolution of water quality problems at the local level.

External Program Partners

While the Indiana Code gives IDEM broad authority to regulate many facets of water pollution, a large majority of NPS planning and implementation requires the voluntary participation of partners external to the agency to improve water quality in Indiana. These stakeholders represent a wide array of interests, including federal, state, and local governments and agencies, as well as university, other nonprofit organizations, and ad hoc interest groups. External stakeholders are engaged in a variety of ways, including, but not limited to:

(1) Participation on watershed steering committees,
(2) Providing technical assistance in their areas of expertise,
(3) Partnering in NPS and watershed education resource development,
(4) Facilitation of outreach messaging,
(5) Integration of resources to achieve NPS goals and objectives, and
(6) Implementation of BMPs to reduce NPS.

IDEM targeted external partner feedback in this revision of the State NPS Management Plan in the form of survey and response. More specifically, stakeholders were provided a questionnaire that asked that they provide their perspective on the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of the current State NPS Program. The questionnaire also solicited stakeholder opinion concerning the major State NPS goals and objectives, and the best strategies to reduce NPS and the role their organization might play in the process. The complete external stakeholder letter and survey can be found in Appendix H.

IDEM also actively looks to recruit new stakeholders in its mission to reduce NPS in Indiana. This is primarily achieved through the duties carried out by the regional watershed specialists and other NPS staff. The watershed specialists assist local and regional groups with watershed planning, but also actively assist groups in stakeholder recruitment, and actively look to develop new partnerships through their participation in agency, academic, and professional organization meetings and conferences. The watershed specialists, and other staff, also represent IDEM on external working committees, including the Indiana Conservation Partnership (ICP) and the Indiana Association of Soil and Water Conservation Districts (IASWCD), among others.

The current list of external partners is varied in its scope, but continues to grow as the NPS program investigates new partnerships and unique opportunities. Current external NPS program partners include:

External Agency Partners

- Indiana Department of Natural Resources (DNR) Programs
  - DNR – LMCP
  - DNR – LARE Program
  - DNR – Forestry
  - DNR – Fish and Wildlife – Fisheries Section
  - DNR – Parks and Reservoirs
  - DNR – Healthy Rivers Initiative
  - DNR – Heritage Trust
  - DNR – Reclamation
  - DNR – Oil and Gas
  - DNR – Water
- ISDH
- Indiana State Department of Agriculture (ISDA)
- OISC
- State Revolving Fund (SRF) Program
- USACE
- U.S. Department of Agriculture (USDA) Programs
  - NRCS
  - Farm Service Agency (FSA)
- USGS
- U.S. EPA
- Adjacent state environmental agencies
- Local governments
- Indiana Conservation Partnership

Nonprofit Partners

- Indiana Association of Soil and Water Conservation District (IASWCD)
- Resource Conservation and Development (RC&D) Councils
- The Nature Conservancy (TNC)
  - Wabash River Basin Initiative
  - Western Lake Erie Basin Initiative
- Local watershed and conservancy groups, lake associations
- Ad hoc interest groups

Academia

- Purdue University
- Indiana University-School of Public and Environmental Affairs (SPEA)
- Indiana University –Center for Earth and Environmental Science (CEES)
- Manchester University
- Grace College – Kosciusko Lakes and Streams program
- Taylor University
- Indiana University-Purdue University – Fort Wayne (IPFW)

Problems, Causes, Sources

Problem

Many of Indiana's waters are not meeting one or more of their designated uses. All Indiana waters, except where otherwise noted, are designated for recreational use and warm water aquatic life use (327 IAC 2-1-3). Even so, about 16,000 miles of the approximately 63,130 miles of streams in Indiana are impaired for one or more of their designated uses (IDEM 2012a), and 144 of the approximately 1,502 lakes in Indiana (not including Lake Michigan) are impaired.

Causes

Important NPS pollutants and the designated use(s) impacted in Indiana include:

- Sediment – aquatic life use
- Nutrients (phosphorus in lakes and stagnant pools, nitrogen as ammonia and nitrate) – aquatic life, recreational, and drinking water (ground water) use
- Pathogens, (*E. coli* as indicator) – recreational use
- Heavy metals – aquatic life use
- Pesticides – aquatic life use, drinking water use
- Oil, grease, and toxic chemicals – aquatic life, recreational, and drinking water use

Parameter	Target	Reference/Other Information
Total Ammonia (NH_3)	Range between 0.0 and 0.21 mg/L depending upon temperature and pH	Indiana Administrative Code (327 IAC 2-1-6)
Atrazine	Max: 3.0 ppb	U.S. EPA Drinking Water Standard
Dissolved Oxygen (DO)	Min: 4.0 mg/L Max: 12.0 mg/L	Indiana Administrative Code (327 IAC 2-1-6)
	Min: 6.0 mg/L in coldwater fishery streams	Indiana Administrative Code (327 IAC 2-1.5-8)
	Min: 7.0 mg/L in spawning areas of coldwater fishery streams	Indiana Administrative Code (327 IAC 2-1.5-8)
E. coli	Max: 235 CFU/ 100mL in a single sample	Indiana Administrative Code (327 IAC 2-1.5-8)
	Max: Geometric Mean of 125 CFU/ 100mL from 5 equally spaced samples over a 30-day period	Indiana Administrative Code (327 IAC 2-1.5-8)
Nitrate	Max: 10 mg/L in drinking water class of water	Indiana Administrative Code (327 IAC 2-11-6)
Nitrite	Max: 1 mg/L in drinking water class of ground water	Indiana Administrative Code (327 IAC 2-11-6)
Nitrate-N + Nitrite-N	Max: 10 mg/L in surface waters designated as a drinking water source	Indiana Administrative Code (327 IAC 2-1-6)
Temperature	Dependant on time of year and whether stream is designated as a cold water fisheries	Indiana Administrative Code (327 IAC 2-1-6)

Table 4. Water quality standards for common NPS pollutants. (from http://www.in.gov/idem/nps/3484.htm)

Any one or more of these pollutants, along with the physical conditions in a waterbody, can have an individual or combined effect on water quality resulting in an impairment of one/more designated uses. Indiana's water quality standards contain numeric water quality criteria (Table 4) that can be use to assess the potential impacts of these pollutants (327 IAC 2-1 et seq.). Numeric

targets for various indicators of pollution and degraded water quality have also been developed for this purpose (Table 5).

Parameter	Target	Reference/Other Information
Nitrate-nitrogen (NO_3)	Max: 0.633 mg/L	U.S. EPA recommendation*
	Max: 1.0 mg/L	Ohio EPA recommended criteria for Warm Water Habitat (WWH) headwater streams in Ohio EPA Technical Bulletin MAS//1999-1-1 [PDF]
	1.5 mg/L	Dividing line between mesotrophic and eutrophic streams (Dodds, W.K. et al., 1998, Table 1, pg. 1459, and in EPA-822-B-00-002 [PDF], p 27.)
	10.0 mg/L	IDEM draft TMDL target based on drinking water targets
Ortho-Phosphate also known as Soluble reactive phosphorus (SRP)	Max: 0.005 mg/L	Wawasee Area Conservancy Foundation recommendation for lake systems, NESWP344
Suspended Sediment Concentration (SSC)	Max: 25.0 mg/L	U.S. EPA recommendation for excellent fisheries
	Range: 25.0-80.0 mg/L	U.S. EPA recommendation for good to moderate fisheries
Total Kjeldahl Nitrogen (TKN)	Max: 0.591 mg/L	U.S. EPA recommendation *
Total Phosphorus	Max: 0.076 mg/L	U.S. EPA recommendation
	0.07 mg/L	Dividing line between mesotrophic and eutrophic streams (Dodds, W.K. et al., 1998, Table 1, pg. 1459, and in EPA-822-B-00-002 [PDF], p 27.)
	Max: 0.08 mg/L	Ohio EPA recommended criteria for Warm Water Habitat (WWH) headwater streams in Ohio EPA Technical Bulletin MAS//1999-1-1 [PDF]
	Max: 0.3 mg/L	IDEM draft TMDL target
Total Suspended Solids (TSS)	Max: 80.0 mg/L	Wawasee Area Conservancy Foundation recommendation to protect aquatic life in lake systems
	Max: 30.0 mg/L	IDEM draft TMDL target from NPDES rule for lake dischargers in 327 IAC 5-10-4 re: monthly average for winter limits for small sanitary treatment plants
	Range: 25.0-80.0 mg/L	Concentrations within this range reduce fish concentrations (Waters, T.F.,, 1995). Sediment in streams: sources, biological effects and control. American Fisheries Society, Bethesda, MD. 251 p.
	Max: 40.0 mg/L	New Jersey criteria for warm water streams
	Max: 46.0 mg/L	Minnesota TMDL criteria for protection of fish/macroinvertebrate health
Turbidity	Max: 25.0 NTU	Minnesota TMDL criteria for protection of fish/macroinvertebrate health
	Max: 10.4 NTU	U.S. EPA recommendation
Nitrate-nitrogen (NO_3)	Max: 0.633 mg/L	U.S. EPA recommendation *

* U.S. EPA recommended criteria are different for parts of southwest Indiana within Ecoregion IX. See Ecoregional Nutrient Criteria Documents for Rivers & Streams for more information.

Table 5. Water quality targets for common NPS pollutants. (from http://www.in.gov/idem/nps/3484.htm)

Pollution Indicators

The parameters shown in Table 5 are considered indicators of pollution if they are found in concentrations that exceed their associated targets. In addition to these parameters, the following parameters and indices (several parameters with results for each combined into a single score), are commonly used to indicate NPS pollution in Indiana:

- Indices of Biotic Integrity (IBI – fish - and macroinvertebrates - mIBI) – indicates the condition of the current biological community against a perceived representative/ideal community. When a community quality is lower than the threshold, the biology indicates that something in the environment (habitat, chemicals, invasive species, etc.) is negatively impacting the aquatic life use in the waterbody. Biological indicators are valuable for water quality monitoring because, unlike chemical parameters, the organisms living in the water can indicate conditions in the water over time. When a waterbody does not meet the threshold for acceptable IBI, the stream reach is listed for "Impaired Biotic Communities" or IBC.
- Qualitative Habitat Evaluation Index (QHEI) – indicates the quality of the aquatic habitat.
- *Escherichia coli* bacteria – indicates fecal contamination from warm-blooded animals.
- Chlorophyll *a* – indicates the presence of algae, which in itself indicates potential nutrient enrichment.
- Indiana Trophic Status Index – a measurement of water quality in Indiana lakes.
- % impervious surfaces – indicates increased potential for stream "flashiness" which leads to scouring, increased sediment and decreased habitat quality for aquatic life.

These indicators, together or separately, help water quality professionals to determine if impairment exists and to identify potential sources of the degraded water quality. For example, a low IBI score could be the result of a habitat condition (little/no shade, lack of woody debris), sanitary/illicit discharge of wastewater (ammonia), nutrient enrichment (especially when combined with low DO, little shade and/or abundant algal growth), heavy metals/high pH, or excess siltation. Site conditions can help to tease out particular land uses that may be impacting water quality.

Sources of NPS:
Because NPS is generally transported through overland flow, widespread land use practices have the greatest potential for contributing NPS. Major sources of NPS in Indiana include:

- Agricultural Management – These activities can cause nutrient, sediment, pesticide, and pathogen loading to waterways through field crop and livestock production.
- Atmospheric Deposition – Pollutants in the atmosphere, such as mercury and lead, can be deposited in waterways through rainfall or through the intermixing of air and water.
- Closed Landfills and Solid Waste Disposal Sites – Rainwater infiltrating improperly closed landfills can cause diffuse pollution to enter the ground water or surface water.
- Ground water – Rainwater infiltrating into the ground can carry with it nutrients, metals, and hydrocarbons that can contaminate ground water resources.
- Hydromodification – Hydromodification, or the alteration of natural waterways through straightening, hard-armoring, and damming. Hydromodification includes channelized streams, denuded streams, low-head and hydropower dams and impoundments, drainage of wetlands/tile drainage, dredged channels. Increased sedimentation and habitat loss are concerns in modified waterbodies.
- Land Application of Non-Agricultural Wastes – Land application of non-agricultural wastes, or biosolids, can pollute ground and surface water through run-off and infiltration of nutrients, pathogens, and heavy metals.

- Urban Issues – Urban run-off and drainage systems provide a direct access for sediment, hydrocarbons, pesticides, nutrients, pathogens, salt, heavy metals, and thermal pollution to enter waterways.
- Natural Resource Extraction – Natural resource extraction, i.e. coal extraction, oil and gas production, and non-energy mineral extraction, can be a conduit for sediment, hydrocarbon, brine, and acid pollution.
- On-Site Sewage Disposal – On-site sewage disposal, or septic systems, can be a source of nutrient and pathogen pollution in both surface water and ground water.
- Streambank/Shoreline Erosion – Erosion of stream banks and shorelines mainly supplies sediment, but also some small amounts of nutrients, to surface waters.
- Timber Management – Erosion of land from timber harvesting techniques, access roads, and loss of vegetation cover can cause sediment pollution.
- Transportation – Run-off from transportation facilities and infrastructure can pick up pollutants similar to urban areas, including hydrocarbons, salts, and sediments.

This NPS Management Plan will work to address the above sources as stakeholders express interest. However, during the next five years, the IDEM NPS program will not fund activities to control NPS from atmospheric deposition. Even so, any watershed group that is funded through a Section 319 grant can count the monies expended to address atmospheric deposition (excluding federal funds or other ineligible expenses) as matching funds.

History of the Non-Point Source Program in Indiana

The 1987 Clean Water Act (CWA) amendments created a federal source of dedicated nonpoint-source funding available to the states, provided that the states assessed the status of their nonpoint source pollution and reported that status to U.S. Environmental Protection Agency (U.S.EPA). Indiana prepared its first assessment of nonpoint source pollution in the state in 1989[7]. At that time, it was estimated that 3579 total stream/river miles and 20,539 lake acres in Indiana were affected by nonpoint source (NPS) pollution. Key sources of impairment listed in the report included agriculture (crop production, pasture and range land, as well as feedlots and aquaculture), silviculture, construction and urban run-off, resource extraction/exploration/development, land disposal, hydrologic/habitat modification and "other" (including atmospheric deposition, waste storage/storage tank leaks, spills, and natural sources) (IDEM 1989).

Indiana received its first appropriation of $1,012,520 of Section 319 dollars in FFY 1990. The money was administered by the Indiana Department of Environmental Management (IDEM), Indiana's CWA designee. IDEM created a new NPS Program in its Water Quality Surveillance and Standards Branch in the Office of Water Management. With this funding, IDEM set up an internal structure to administer funds, continued its NPS assessment activities, and passed through $355,000 to statewide and local projects. Over the next twenty-two years, IDEM would receive nearly $77 million in Section 319 funding to assist with implementation of the State NPS Management Plan.

Since the NPS program was established in Indiana, it has undergone a myriad of internal shifts and evolutions in response to changing priorities and needs at the federal, state, and local levels. Just a few of them are highlighted here.

From the program's inception, the state recognized that NPS management was larger than the program housed at IDEM. In order to complete the first NPS assessment, leaders of the IDEM and Indiana Department of Natural Resources (IDNR) pulled together an inter-agency task force to analyze the most up-to-date information on potential sources of NPS and devise strategies to ameliorate it. Members of the task force included the Lieutenant Governor's Office; IDNR's Divisions of Water, Reclamation, Forestry, Fish and Wildlife, Soil Conservation, and Oil and Gas; the Office of the State Chemist (OISC); Purdue's Cooperative Extension Service; the Agricultural Stabilization and Conservation Service (now the Farm Service Agency, or FSA); the Soil Conservation Service (now the Natural Resources Conservation Service, or NRCS); State Department of Highways; the State Board of Health; and IDEM's Offices of Water and Solid and Hazardous Waste Management.

[7] From *Nonpoint Source Assessment Report* (IDEM 1989): "Of the estimated 90,000 miles of water courses in Indiana, only about 20,000 miles of streams and rivers are large enough to support all designated uses throughout most of the year" (p.1)

Many potential sources of NPS were (and continue to be) present in Indiana. However, due to the large presence of agricultural land use in the state (nearly 62%), and its potential to be a large source of NPS in Indiana, IDEM partnered with NRCS early in its NPS work to coordinate with the local Soil and Water Conservation Districts (SWCDs) and their local field offices to reach out to the agricultural community. In FFY 1992, IDEM funded a NPS liaison between NRCS and itself. This arrangement lasted for eleven years. From FFY 1999 through 2003 IDEM also used Section 319 dollars to fund NRCS personnel to work with local watershed interests and provide technical assistance around the state. This "Watershed Team" was very effective at getting watershed initiatives off the ground at the local level. Due to the success of the Watershed Team, when NRCS could no longer spare personnel for the NPS program (in 2003), IDEM was able to create four in-house Watershed Specialist (WSS) positions (in 2004) that continue to provide local support and technical assistance to the present.

By 2003, the Indiana NPS program had blossomed into its own. Several key accomplishments were completed in this year. By this time the NPS Program had released a Watershed Management Plan (WMP) checklist (in 2001); which was revised in 2003 to include the 9 Key Elements of a Watershed Management Plan (U.S.EPA 2002). Also in 2003, the program published a comprehensive manual for organizing a watershed group and writing a management plan[8]. The State Revolving Fund Loan Program had also developed a NPS program to dovetail with the NPS grants program and completed its first project with the City of Evansville in 2003[9].

Another internal reorganization moved the NPS program into closer integration with the TMDL and 305(b)/303(d) Assessments programs in 2007 when the Watershed Management Section (WMS) combined with those two programs to become the Nonpoint Source/TMDL Section in the Watershed Planning Branch. The staff had grown to 14 in number and included 6 project managers, a Quality Assurance Project Plan (QAPP) Coordinator, the Section Chief, a Geographic Information Systems (GIS) Coordinator, a clerical assistant, and 4 WSS. The WSS were equivalent to the Watershed Conservationists: they frequently traveled to local watershed group steering committee meetings, public meetings, one-on-one meetings with watershed coordinators throughout the state, groups that were interested in writing a WMP, and groups looking for funding for their remediation activities.

The NPS program endured another internal shift when it became part of the Watershed Assessment and Planning Branch in 2010. There it remained collocated with the 305(b)/303(d) and TMDL programs and was paired with the Assessment Branch (Biological Studies Section, Surveys Section, and Toxicology and Chemistry Section). This alignment enabled the NPS program to capitalize on the monitoring expertise of the Assessment Branch to begin baseline studies for watershed plans and follow-up monitoring for success. At present, the NPS program remains in the Watershed Assessment and Planning Branch as part of the Watershed Planning and Restoration Section.

[8] *Indiana Watershed Planning Guide*

[9] The project remediated a rail site and contaminated ground water that flows to Pigeon Creek.

Current Approach

IDEM's current approach to managing nonpoint source pollution is multi-layered. Through careful monitoring, targeted grantmaking, strategic outreach and education, powerful partnerships, and responsible administration, Indiana has been able to show successful restoration of several streams and watersheds.

Monitoring

Indiana's NPS program encourages grantees to monitor their watersheds for the purposes of characterizing the watershed for watershed management plans and to document trends in water quality during and subsequent to implementation of a WMP. Grantees and other interested parties sometimes use the state volunteer monitoring program Hoosier Riverwatch in combination with other methods to gather water quality data for their particular project. Hoosier Riverwatch and other grantee-generated data are generally not included in the state's dataset for assessment purposes because it generally does not attain a high enough rigor (or, data quality level, set through quality assurance and quality control practices of the monitoring organization); nor, was there generally official follow-up by IDEM to evaluate water quality improvements.

Beginning in 2009, IDEM made strides to allocate resources for targeted success monitoring of watersheds that had received 319 funding. Also in 2009, the state adopted the Nonpoint Source Monitoring Strategy into the state Water Quality Monitoring Strategy (WQMS). In late 2010-early 2011, the state thoroughly revised its WQMS, the document which guides the way in which IDEM will deploy staff and other monitoring resources. Among other things, the 2011-2019 WQMS prescribes baseline monitoring for at least one watershed group receiving NPS funding per year and follow-up success monitoring where 319 implementation funding has been spent in order to document improvements in water quality. A build-out of the monitoring program's Assessment Information Management System (AIMS) database stores NPS project data for future reference and analysis. Additional monitoring information is in the "Monitoring" section beginning on page 29.

Targeted Grantmaking for Water Quality Improvement

The majority of 319 funding provided to Indiana by U.S. EPA is passed through to state and local organizations to monitor and research water quality issues, prepare community-based 9 Element watershed management plans, implement those plans (including the installation of on-the-ground practices), and perform outreach and education activities. Each fall, IDEM solicits proposals from nonprofits, agencies, watershed groups, universities and other eligible entities for water quality projects in furtherance of the applicant's mission and the State NPS Management Plan. From FY 2008-2012, IDEM obligated over $14.8 million to pass through to these grantees.

Strategic Outreach and Education

IDEM NPS grants support statewide and local education efforts to both further public awareness of nonpoint source pollution and to train local watershed leaders to develop and implement watershed management plans at the local level. Local watershed grantees are encouraged to include an outreach aspect to each nonpoint source project funded through IDEM NPS. In addition, IDEM has supported various statewide outreach campaigns.

Local leaders and watershed coordinators have an annual opportunity to receive advanced training in watershed management through the Indiana Watershed Leadership Academy (IWLA). Since 2006, Purdue University has trained 224 watershed coordinators, leaders, volunteers, consultants and local government leaders through its IWLA program, funded through IDEM's 319 grant program. Participants learn skills related to watershed planning, working with local government and plan commissions, sharing the work with volunteers, monitoring water quality, and estimating load reductions. IDEM continues to support this program while encouraging the university to find alternative funding sources to sustain the program.

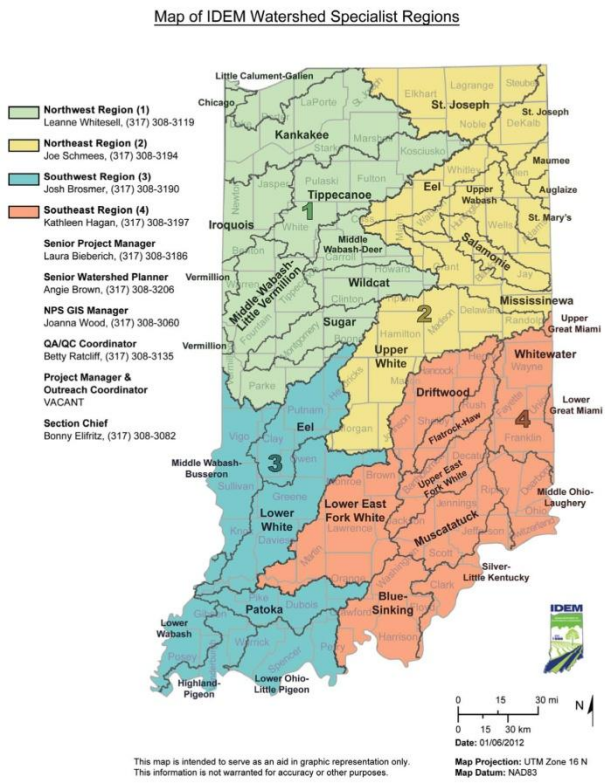

Figure 12. Watershed Specialist coverage areas.

IDEM also employs four regional WSS to work with local watershed efforts to build community buy-in, set appropriate watershed goals, coordinate with similar efforts in the area, find sources of funding, and coordinate statewide messaging. The WSS are housed in Indianapolis and serve stakeholders in assigned basins across the state.

Powerful Partnerships

The IDEM NPS program utilizes multiple partnerships to reach diverse stakeholder groups and further its goals in Indiana. Some of those partnerships are highlighted below.

IDEM is one of eight agencies and organizations comprising the **Indiana Conservation Partnership** (ICP). Along with the Indiana State Department of Agriculture (ISDA), NRCS, USDA- Farm Service Agency (FSA), Purdue University Extension, the Indiana Association of Soil and Water Conservation Districts (IASWCD), the State Soil Conservation Board, and the Indiana Department of Natural Resources (IDNR), IDEM works toward the conservation and/or protection of Indiana's soil and water resources. Several initiatives, such as the Conservation Cropping Systems Initiative (CCSI; education on the use of a system of practices, such as cover crops, nutrient management, continuous no-till/strip-till, and pest management to promote soil health); the ICP Training and Certification Program; Indiana's Nutrient Reduction Strategy; Indiana's Rapid Watershed Assessments; and a multitude of local watershed efforts have a direct effect on NPS management in Indiana. Pooling our resources as a partnership avoids redundancy and inconsistent messaging to local stakeholders.

Aside from the ICP, the NPS program coordinates with several **state and federal agencies** at the state and local levels to share data, pool resources, and leverage expertise on key NPS issues and projects. Partners such as the USGS provide monitoring expertise and the Indiana State Department of Health (ISDH) and local health departments are valued partners for laboratory support and outreach on septic system issues. The Lake Michigan Coastal Management Program (LMCP), administered through the DNR Division of Nature Preserves, provides additional federal

funding and local coordination of various funding pots to accomplish NPS prevention. The DNR's Division of Reclamation is a key partner to revitalizing former mining areas in the southwest part of the state, while their Division of Oil and Gas has coordinated with the NPS program on oil and mine extraction-related NPS issues.

Academia has long been a partner in dealing with Indiana NPS. The Indiana Clean Lakes Program (CLP) is conducted by Indiana University – School of Public and Environmental Affairs (SPEA) under a grant agreement with IDEM. It is funded through the 319 program to sample a subset of Indiana's lakes to provide water quality data to make assessments on whether or not those lakes are meeting designated uses. In addition, they run a volunteer lakes monitoring program that educates stakeholders and trains them to collect data for trend analysis, and encourages them to get involved in lake stewardship. Another partnership with Indiana University-Purdue University Indianapolis (IUPUI) assisted with the initiation of Indiana's, blue-green algae surveillance program. The Indiana Geological Survey (IGS), housed at IU, is a strong ally on ground water issues research and characterization.

Purdue University is also a major academic partner for the NPS program. Aside from the IWLA referenced above, Purdue has participated in the NPS conversation through research on agricultural tile drainage, septic systems, and the human dimensions of natural resource management. Purdue has developed several online watershed tools to assist state and local watershed managers including the Long Term Hydrologic Impact Analysis tool (L-THIA), the Indiana Watershed and Watershed Group Finders, the Social Indicators Data Management and Analysis (SIDMA) tool, and the Indiana Water Monitoring Inventory.

Partnerships with **non-profit groups** such as The Nature Conservancy (TNC) and the Indiana Association of Counties have resulted in the placement of best management practices on the ground. Additional nonprofit partners include Indiana's land trusts (particularly those with staff), incorporated watershed organizations, conservation-oriented nonprofits (such as the IASWCD and Resource Conservation and Development Councils), and lake associations, including the Indiana Lake Management Society.

Of course, partnerships between **programs internal to IDEM** are integral to accomplishing the NPS program's mission. Some examples of these are working with the Clean Water State Revolving Fund (CWSRF) program to provide state match to the federal 319 grant; coordinating with the Total Maximum Daily Load (TMDL) program to provide data and load reductions for watershed management plans; IDEM's monitoring team provides sampling services for baseline and targeted monitoring projects; and the integrated report coordinator assesses the data provided to validate impairments and successes. Ground water (GW) staff work with NPS staff to discuss how source water protection plans could be written to meet WMP approval requirements. Work with the Storm Water Program staff, including the MS4 coordinator, has led to the introduction of MS4 operators and watershed groups in a number of communities, with the potential of unified messaging to the public on storm water issues. The NPS program has also held coordination meetings with IDEM's Office of Land Quality Confined Feeding staff to understand the rules being applied to confined feeding of livestock, and to pass on contacts for local concerned citizens.

Responsible Administration

IDEM is constantly seeking efficiencies in its use of taxpayer dollars. In 2011, IDEM combined the positions of Project Manager and WSS so that each of four identified regions would be served by one person, instead of two. This allowed efficiencies in staff salary and benefits, travel time and cost, and increased productivity when grantees had one contact instead of two at IDEM. In addition, this freed up staff to conduct administrative projects (such as the revision of this document) in-house. In 2013, the administrative budget was reduced by $169,929 from the FFY12 level by reassigning 3 FTEs to other funding sources and by basing equipment, supply and travel budgets on recent expenditures and carefully planned needs.

IDEM has also adapted project policies and procedures to better serve its grantees. Both the Section 319 application form and instructions were updated in FFY 2013 to help the NPS program receive relevant applications and encourage good projects. In FFY 2014, a Notice of Intent requirement was added to the Request for Proposals. The program also updated the proposal review process in an attempt to reduce subjectivity and provide all reviewers with the same background information (when there was such) on applicants. The program also recently changed its cover crop maintenance policy from five years to one year, to encourage the use of cover crops at the local level, and allowing payments on cover crops up to three years.

Program Successes to Date

The NPS Program has experienced a number of successes to date.

Successes in Water Quality Monitoring
Nonpoint source funding has had a profound effect on water quality monitoring in Indiana. The Clean Lakes Program, which began in 1989 and continues to this day, conducts both professional and volunteer monitoring on Indiana's public freshwater lakes. Through a 319 contract with IU, samples are collected from a subset of Indiana lakes each year for the purposes of 305(b) and 314 assessments.

The toxics sampling program (fish and sediment) began as a 319-funded project in 1989. Though sediment sampling is no longer a part of IDEM's water quality monitoring program, the fish tissue sampling, for the purposes of 305(b) assessments and preparation of fish consumption advisories, remains in place. The program is no longer funded through 319, but has transitioned to Section 106 and state funding sources.

Indiana's first NPS Monitoring Strategy was submitted and conducted in 2010. At present, IDEM performs nonpoint source-related monitoring, including baseline monitoring for watershed groups (since 2011), monitoring for success (since 2010) and beach monitoring for cyanobacteria and cytotoxins (since 2010).

Indiana's Hoosier Riverwatch program has been the state's leading volunteer organization for stream monitoring since 1994. Since that time, hundreds of volunteers have been trained to measure water quality parameters in waters of the state. Until late 2012, the program resided at the IDNR. However, given that many watershed groups utilize Riverwatch methods to monitor water quality in their watersheds, and that Riverwatch methods are designed to detect the most common nonpoint source pollutants, it just made sense to more closely connect the program to IDEM's NPS programs. In 2013, the Riverwatch program was moved to IDEM's Watershed Assessment and Planning Branch and is now funded using 319 funds.

Successes in Water Quality Improvement
Over the life of the program, 97 watershed management plans have been written and approved by IDEM; nearly $14 million dollars have gone toward implementing those plans; and an estimated 281,714 tons/year of sediment, 493,170 lbs/yr phosphorus, and 805,029lbs of nitrogen have been kept out of Indiana and downstream waters as a direct result of this program. IDEM has also shown direct results of success through Success Story and Measure W reports to U.S. EPA. Through these reporting mechanisms, IDEM has documented a total of 16 segments (157.56 miles) that have been delisted or improved as a direct result of Section 319 NPS involvement.

Waterbody Name	Miles	Impairment Removed	Reported as (Measure W/ Success Story)
Pigeon Creek	32	Chlordane	Success Story
Lower Clifty Creek	8.12	*E. coli*	Measure W/SS
Big Walnut	50.4	*E. coli*	Success Story
Bull Run	25.09	Impaired Biotic Communities	Measure W/SS
Metcalf Ditch	14.33	Impaired Biotic Communities	Measure W/SS
Stotts Creek (2)	14.48	Impaired Biotic Communities	Measure W/SS
Mill Creek	13.14	Impaired Biotic Communities	Measure W

Table 6. Waterbodies Reported to U.S. EPA under its Measure W (WQ-SP12.N11) and Success Stories (WQ-10) programs.

Successes in Water Quality Protection

Refuges, Preserves, and Easement Programs

The state has also seen success in water quality protection, in particular through the establishment of several refuges and easement programs to protect water quality and aquatic life use. In the original 1989 NPS Assessment, Indiana reported that the USFWS was working to create the **Patoka National Wildlife Refuge** (to add to the Muscatatuck Refuge, which was established in 1966). The Refuge was established in 1994 along 30 miles of the Patoka River corridor. It includes wetlands, floodplain forest, and uplands – all beneficial for NPS control. Information from the USFWS indicates that, in addition to fish and wildlife habitat goals, one of the purposes of establishing the refuge was to improve water quality. In addition, **Big Oaks NWR** (BONWR) was established in 2000, on the closed Jefferson Proving grounds. Big Oaks is located on 50,000 acres in Jefferson, Jennings, and Ripley Counties. While the BONWR is known as a Globally Important Bird Area, it also encompasses several aquatic habitats including Big, Otter and Graham Creeks; cave systems; fens, seeps and springs; and flatwoods within its boundaries.

In addition to the federal refuges, several significant state projects have been initiated to increase wildlife habitat and improve water quality. The **Healthy Rivers INitiative**, launched in 2010, aspires to protect some 69,000 acres along the Wabash and Muscatatuck Rivers and Sugar Creek. The project also involves restoration and enhancement of riparian and aquatic habitats and the species that use them. Similar projects include the **Goose Pond Fish and Wildlife Area (FWA)** in Greene County, **Wabashiki FWA** in Vigo County, and the **Loblolly Marsh Nature Preserve** in Jay County.

Indiana's Conservation Reserve Enhancement Program (**CREP)** is a federal-state partnership offering water quality practices and land retirement to riparian and wetland landowners at an attractive rate. The goal of the program is the enrollment of 26,250 acres in land retirement. The program requires a 20% state match, which is achieved through the Clean Water Indiana (CWI) fund. Indiana CREP is available in eleven 8-digit watersheds in 65 counties (Figure 13):

Highland-Pigeon (HUC 05140202)
Lower Wabash (HUC 05120113)
Lower East Fork White (HUC 05120208)
Lower White (HUC 05120202)
Middle Wabash-Busseron (HUC 05120111)
Middle Wabash-Deer (HUC 05120105)

Middle Wabash – Little Vermillion (HUC 05120108)
Tippecanoe (+Tippecanoe Priority Area additional incentive) (HUC 05120106)
Upper East Fork White (HUC 05120206)
Upper Wabash (HUC 05120101)
Upper White (+Upper White Priority fish kill area additional incentive) (HUC 05120201)

As of Jan 1, 2012, there were 874 CREP contracts in place, covering more than 7,000 acres and protecting approximately 600 linear miles of stream reaches in Indiana. CREP goals are to:

- Protect a minimum of 3,000 linear miles of watercourses through the installation of conservation buffer practices
- Reduce by 8% the amount of sediments, nutrients, and agricultural chemicals entering watercourses within the targeted watersheds
- Increase the acres of wetlands in the watersheds for erosion control, sediment reduction, storm water retention, and nutrient uptake.
- Enroll 15% of the eligible watersheds' cropland, subject to normal Conservation Reserve Program (CRP) acreage limits by county
- Enroll 8% of the CREP acres in voluntary, ten-year contracts in the Tippecanoe watershed.
- Enroll 10% of the CREP enrolled acres in voluntary, permanent easements in the Tippecanoe and Upper White River watersheds.
- Seek enrollment of 26,250 acres of eligible cropland including frequently flooded agricultural lands, and restorable wetlands.

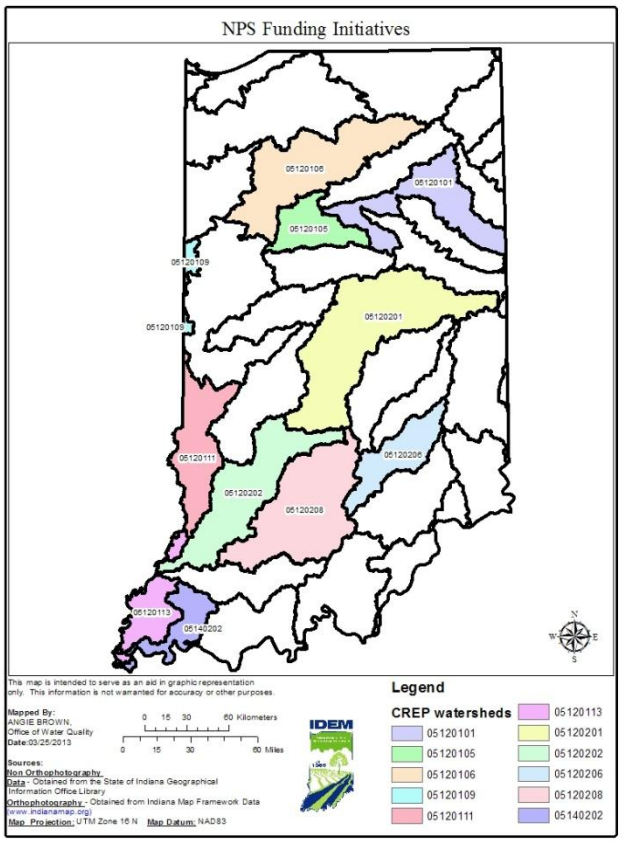

Figure 13. CREP watersheds.

As of the end of State Fiscal Year 2012, Indiana has enrolled 7060.6 acres in CREP. To date, Indiana has contributed $2.3 million to the CREP program.

As of July 1, 2013, three eligibility restrictions on wetland restorations within CREP have been lifted. Wetland restorations, CREP's largest cost-share BMP, now share the same guidelines as those in the USDA Conservation Reserve Program. These changes will allow a significant number of acres across all eleven watersheds to be eligible for enrollment into the program.

The **Bicentennial Nature Trust** dedicated $30 million to preserving important natural areas for the future (in the same spirit as the state parks system was created for the centennial celebration). This is a short-term project ending in 2016.

The **Indiana Heritage Trust** was founded in 1992 to protect Indiana's natural heritage for future generations. It provides funding for conservation easements and land acquisitions in sensitive areas of the state (e.g. rare habitats and species). It is funded through appropriations from the General Assembly, sales of the Environmental license plate, and private donations. It has protected more than 56,000 acres to date, including wetlands and riparian acres.

State-funded Erosion-Control Programs

In addition, Indiana has had several state-led erosion-control programs for agricultural lands. T by 2000, LARE, CREP, and CWI programs have all served at one time or another to control sedimentation by installing best management practices on vulnerable erosive soils. These programs are described thoroughly as part of the Funding Mechanisms section of this Plan.

Regulatory Protections

Rules 5, 6 and 13 are Indiana's storm water rules. Rule 5 regulates sediment releases from construction sites where land disturbance is one acre or more in size. Rule 6 is the industrial storm water rule which regulates the discharge of pollutants that are associated with industrial activities for specific industries operating under specific standard industrial classification codes . Rule 13 is the MS4 rule for populated areas.

In addition, Indiana has promulgated rules to protect water quality from confined feeding operations (both the federally-defined "concentrated animal feeding operations" and the state-defined "confined feeding operations" [327 IAC 19]) spills, inappropriate fertilizer applications (355 IAC 7) and pesticides (e.g. 355 IAC 4 et seq.; 357 IAC 1-12).

Successes in Integrating Programs/Partnerships

Since the last revision of the State NPS Management Plan, the NPS section has been working hard to break down silos and integrate related programs to extend the resources of all NPS programs. Specific initiatives are referenced below.

Monitoring

The IDEM Office of Water Quality (OWQ) reorganized in 2010 to combine the Watershed Planning Branch with the Assessments Branch to create the Watershed Assessment and Planning Branch. This integration has permitted crucial conversations regarding targeted monitoring needs and how watershed groups should be monitoring; and has allowed baseline characterizations for watershed groups to be completed by IDEM. These conversations culminated in an updated WQMS for 2011-2019 which included efficiencies in staff time and use of limited resources. In addition, IDEM assumed the Hoosier Riverwatch (citizen-monitoring) program in 2012 from the IDNR.

Integration with other non-profit, local, state and federal programs

As illustrated throughout this document, the NPS program has a multitude of non-profit, local, state and federal partners with whom it works. Since the last revision of the Plan, IDEM NPS has:

- Completed work on a TMDL/WMP template that will bring TMDLs into alignment (to the extent practicable) with the WMP needs of the watershed group;
- Commenced baseline monitoring for watershed groups/grantees;
- Coordinated with the IDEM monitoring sections and the 305(b)/303(d) coordinator on success reporting;

- Conferred with the IDNR-LARE program on watershed management plans and diagnostic studies;
- Contributed to the LMCP Coastal Nonpoint Program plan;
- Called program coordination meetings with NPS-related programs including Confined Feeding, Storm water, Wetlands, and IDNR – Forestry, Ground Water (Source Water and Wellhead Protection), USFWS, OISC, and U.S. Geological Survey
- Collaborated with the Indiana Rural Wastewater Task Force, Indiana Rural Community Assistance Program, and Alliance for Indiana Rural Water on septic system and drinking water issues;
- Collaborated with IDNR Division of Reclamation and the Southwest Indiana Brine Coalition on coal, oil and gas-related watershed issues
- Collaborated with the Indiana County Surveyors Association, TNC, Purdue and Indiana University Center for Earth and Environmental Sciences, as well as several consultants, on drainage and hydromodification issues;
- Collaborated with other members of the ICP on the ICP's Leadership, Training and Certification Program, and Pathway to Water Quality (PWQ) committees; and
- Cooperated with the ISDH on multiple training opportunities.

Successes in Outreach and Education

IDEM has made a large investment in outreach and education over the past five years. In addition to continuing the WSS outreach and program coordination efforts, IDEM also updated its website content and produced web-based tools to reach out to the citizens of Indiana. The online watershed toolkit includes information specific to Indiana watershed efforts trying to organize a group, write a watershed management plan, inventory their watershed, choose and cost-share BMPs, educate stakeholders, and procure sustainable funding for their watershed work. The NPS program also revised the Indiana Watershed Planning Guide and made it available online to watershed coordinators and volunteers.

IDEM completed additional outreach and education projects in collaboration with partners. IDEM sends representatives to participate in the PWQ exhibit and steering committee (an ICP outdoor learning center housed at the Indiana State Fairgrounds), the IWLA (hosted by Purdue University), the IASWCD's Conference Planning Committee (the IASWCD conference is the largest conservation-oriented conference in the state and where the ICP and other NPS partners annually congregate to share successful endeavors as well as lessons learned), and Networking Roundtables where programs educating on NPS topics can coordinate their training efforts, instead of duplicating them. In addition, IDEM contributed grant support to the Indiana-based Clear Choices Clean Water campaign, which has resulted in an estimated 18,532 lbs phosphorus saved across the country, the majority of which is in Indiana.

Successes in Adaptive Management

IDEM believes in the philosophy of continuous improvement. As such, it is continually analyzing and adapting programs to better meet the needs of the state and watershed stakeholders. In the past five years, IDEM has adapted its program policies to increase participation in practices that will keep NPS out of streams. One example of this is the decision to change the cover crops maintenance requirement from five years to one year, which increased adoption of the practice. Another example is the decision to publish a list of "Eligible BMPs" that are not subject to pre-

approval by IDEM (Appendix I). Having this list available allows grantees to respond more quickly to potential cost-share participants.

In response to a request for more guidance to grantees developing WMPs, IDEM NPS updated its Watershed Planning Checklist in 2009 (Appendix E) to better clarify IDEM's expectations on WMP elements. A similar request for monitoring guidance led IDEM to contract with Purdue University to develop a set of environmental indicators of water quality improvement, memorialized as the *Monitoring Water in Indiana: Choices for Nonpoint Source and Other Watershed Projects* manual (a.k.a. "the Monitoring Handbook").

Program Challenges to Date

The Indiana NPS program has experienced a number of challenges to date. In some cases, IDEM NPS has the authority to resolve those challenges. In other cases, outside forces impose challenges on the program, which will need to adapt in order to continue providing satisfactory progress on its commitments to U.S. EPA. In both cases, it is the intention of the NPS program to address the identified challenges through the goals and strategies of this Plan.

Decrease in Funding for Projects

One of the largest challenges of Indiana's NPS program is a decrease in dedicated funding for planning and mitigating NPS. Non-federally-linked state funding for NPS is almost exclusively available through the CWI and LARE programs, which – when fully funded – have a combined annual appropriation of approximately $4 million. (Note that the state recycled funds of the CWSRF are not included in this total, as those dollars depend upon previous federal appropriations to make loans available.) Therefore, the State relies heavily on the federally-funded 319 program to reduce and prevent NPS in Indiana. However, the EPA study of 2011 demonstrated a downward trend in federal funding of the 319 program, from an all-time high of $238.5million in 2003 to $175.5 million in 2011. Though it could be argued that these reductions are offset by increased targeted federal funding available to Indiana, such as funding for the Great Lakes through the Great Lakes Restoration Initiative (GLRI - through the U.S. EPA Great Lakes National Program Office) or drainage to the Gulf of Mexico through the Mississippi River Basin Initiative (MRBI, available through the NRCS), these types of regionally-competitive funding sources do not insure that Indiana will receive any portion of those funding sources, nor that the most critically-impaired watersheds in Indiana will be prioritized for regional funding.

Watershed management plans (WMPs) that meet U.S. EPA's 9 Elements for Watershed Management Plans (U.S. EPA 2002) are the cornerstone of Indiana's NPS reduction efforts. These WMPs identify the extent of pollution problems, identify causes and sources of that pollution, and outline a strategy to reduce NPS in the targeted watershed. Funding for implementation of a WMP can be from diverse sources, including local, state, and federal mechanisms. However, funding for planning is still necessary. As of 2013, roughly 32% of Indiana's 12-digit HUC watersheds have a watershed management plan. With the federal shift to an emphasis on implementation of WMPs and other allowable plans (USEPA 2013), planning for watersheds that still do not have a WMP may be slowed.

In addition, funding for staffing of watershed groups/projects is diminishing. Though several federal programs (including Great Lakes Commission, GLRI, MRBI, and National Water Quality Initiative funding) have provided dollars for on-the-ground practices since the 1990's, the funding generally does not include monies for staff or technical assistance, choosing rather to emphasize implementation of on-the-ground mitigation measures. In Indiana, this presents a difficulty for watershed groups and others working on watershed-related projects (e.g. SWCDs), as state and local funding for such positions is typically very limited.

Lack of Assessment Methodology for some NPS Pollutants

Water quality standards, and their interpretation in the form of CWA assessments, form the foundation of the state's water quality program. Water quality standards are determined at the

state level, with approval by U.S. EPA, to reflect the conditions of both point and nonpoint source pollutants in the state as appropriate to meet the "fishable, swimmable" goals of the CWA. Utilizing these standards, the State is able to determine which waters are "impaired" or do not meet beneficial use requirements (i.e. the WQS are the basis of the 303(d) list). In Indiana, numeric surface water criteria related to NPS include *E. coli*, metals, salts (e.g. chloride and sulfates), ammonia, pH, temperature, pesticides, and other organic substances (327 IAC 2-1-6 et seq.). Data is currently being collected to determine appropriate numeric nutrient criteria for streams and a rule-making is in progress to set a numeric criterion for phosphorus in lakes. However, several NPS pollutants and issues (e.g. sediment, "flashiness" and biological oxygen demand) lack numeric surface water quality criteria and are assessed based on narrative criteria using a combination of surrogate parameters and conditions present over a prescribed frequency (IDEM 2012b). Consequently, some waters that may be degraded or impaired by those parameters may not appear on the 303(d) list as impaired for that parameter (e.g. sediment/turbidity/ TSS does not appear on the 303(d) list *even when* sediment is the principle agent of degradation). Often these issues are captured under an impaired biotic communities (IBC) listing, but since IBC can result from a number of issues including degraded habitat, elevated nutrients, low dissolved oxygen, high temperatures, etc., the listing itself does not necessarily indicate the cause or source of the problem.

WQS allow IDEM to determine whether or not a waterbody is impaired for its designated uses. Impairment places a waterbody on the 303(d) List of Impaired Waters (those waters which require a TMDL). Once a TMDL has been written for a waterbody, permit modification and watershed management planning are the next steps for TMDL implementation. IDEM's NPS program uses 303(d) listings as one factor to determine priority for grant awards. Because some NPS pollutants do not have numeric criterion codified in the WQS, waters may not be listed as impaired for those parameters and it is possible that the IDEM is missing opportunities for better watershed management in polluted watersheds that are a lower priority for funding based upon their 303(d) status.

This challenge is not easily resolved. IDEM has collected data on nutrients, which will be used to develop numeric criteria for nutrients, but available resources limit the pace at which revisions to the WQS can be developed and implemented. IDEM will continue to work with U.S. EPA to develop appropriate WQS as resources allow.

Staff Turnover at the State and Local Levels

Section 319 staff turnover, particularly among state-level primary project managers, has been a challenge since the program's inception. With staff turnover at the state level, local project staff can become frustrated with their working relationship with the state as uncertainty enters into their project. This uncertainty results from a lack of experience in new staff and the lag time it takes to get them up to speed. Newly-hired project managers experience a learning curve in regard to program policies, current/standard operating procedures, and expectations of project performance, all of which increase the time needed to respond appropriately to grantees. Turnover at the state level has occurred for a number of reasons, both personal and professional, at all levels of program management. Within the past five years, turnover among primary project managers has mostly been due to the pay grade and status level of the position. Prior to July 2011, project manager positions at IDEM were entry-level positions. Consequently, project manager turnover was relatively high as staff in those positions were promoted within the agency or left the agency for more lucrative employment. With the integration of project management duties

into the WSS positions, it is expected that staff turnover will decrease, as these positions are near the top of the agency's nonsupervisory staff paygrade.

Local watershed groups also experience high staff turnover. This is often the case when watershed coordinators are funded solely with Section 319 funds. While some watershed coordinators are able to stick with the project until the end of their grant(s) period, others leave for more stable employment before the end of the grant term. At times, there is a lag between project grant awards such that a coordinator faces unemployment for several months before the next grant is awarded. Staff turnover at the local level is detrimental to projects because, as learned by one of the program's grantees:

> "The more partnerships and contacts the projects has the more successful it will be – the more people you know or know you the easier it is to schedule workshops, obtain good speakers, and assist with other projects" (IDEM 2011 Annual NPS Program Report).

Local project success is built on rapport with local leaders. When project staff changes, that rapport is not transferred to the new leadership, who will need time to gain trust with stakeholders. This cyclical process delays watershed improvements statewide and has been long-recognized as a challenge. Strategies to manage this challenge at a statewide level have been unsuccessful to date.

Challenging Sources

While there are many sources of NPS in Indiana, two in particular have been difficult to address, both at the legislative and programmatic levels.

Septic Systems

Residential septic systems are regulated by the ISDH, who delegates administration of most routine septic installations and inspections to the county health departments. While 410 IAC 6-8.3 regulates the standards of construction of septic systems, there is no uniform statewide control on failed or failing septic systems or legacy straight-pipes (i.e. illicit discharges and "dumps to ditch" systems). County health departments typically do not have the staff or political backing to initiate maintenance inspections of septic systems and rely on complaints to investigate potential sanitary pollution. While water quality standards can, and have been, used to stop discharges from straight pipes, enforcement action at this level is relatively rare. Septic systems are expensive (and sometimes impossible, due to lot size limitations) to replace. Legacy straight-pipes are believed to be relatively common, but difficult to detect. Currently, Indiana funds sewer expansion through the CWSRF. Through the NPS program of the CWSRF, communities can request to take septic systems off-line as part of a sewer expansion project. And, while at least 10,500 homes that were on septic systems are now on sewer[10], the funding is limited to projects sponsored by municipalities that also have a traditional infrastructure loan through CWSRF. The rural homeowner who is not in or near a community with a CWSRF infrastructure loan does not have access to those funds to repair or replace a septic system.

Many opportunities are available to strategize about the septic problem. Lawmakers discuss the issue in nearly every General Assembly session. One group, the Rural Wastewater Task Force (RWWTF), attempts to inform public policy related to on-site sewage disposal (i.e. "septic")

[10] Through CWSRF since 2004.

systems. The group meets regularly during the Indiana General Assembly's legislative sessions and also between sessions. The Rural Community Assistance Program (RCaP) provides assistance to rural water and wastewater treatment systems, including regional sewer districts that often result in the removal of septic systems from the landscape. Formal and ad-hoc meetings of representatives from multiple agencies and statewide organizations, such as IDEM and ISDH, RCaP, the Alliance for Indiana Rural Water, Indiana Office of Community and Rural Affairs, USDA's Rural Development, among many others present various opportunities to brainstorm solutions to pollution from failed or failing septic systems.

Modified Hydrology

Agricultural Drainage/Loss of Wetlands

NPS prevention and drainage are not mutually exclusive goals. Indiana's current drainage code dates back to the federal Swamp Act of 1850 (9 Stat. 519), which provided land to the states by the federal government on the condition that it be drained and plowed. Indiana's first statewide drainage code became effective in 1852 when roughly 25% of the state was wetlands. An Indiana Bureau of Legislative Information bulletin from 1914 estimated that 625,000 acres of "waste" lands could be arable with adequate drainage (Kettleborough 1914). It also notes that 1.5 million acres had been drained by 1914 – mostly in northwestern IN. The benefits of drainage outlined in the document include: economic (able to occupy and farm the land; public health – reduce malaria, change in air quality and humidity, drinking water, mosquito/bug and reptile threats). Drainage of the land through lowering water tables and shunting the excess water to channelized, denuded streams was a common practice in early statehood that persists through today. Through drainage programs/projects, 4,737,000 acres of wetland have been drained. The hydrological significance of this loss is seen in major flood events and the water quality significance is great (erosion, head-cutting, nitrate delivery to streams through field tiles, lost nutrient uptake functions of wetlands). Recently, county surveyor participation in water quality projects and outreach events, such as water quality presentations at the annual Purdue Road School training, installation of two-stage ditches, and attendance at the IWLA, has increased the number of drainage projects that consider water quality needs as well as water quantity.

Urban Impacts

Likewise, streams in urban areas have not escaped impacts. As towns and cities grew up around lakes, rivers, and streams, construction often took place in the floodplains, which in turn increased the need to protect buildings and infrastructure from floodwaters. Streams were placed into hard conveyances, such as concrete and pipes, and sometimes buried to protect dwellings and other structures. The sediment transport function of moving waters is a threat to buildings and infrastructure. When erosion impacts upon man-made structures become imminent, rivers and streams are typically straightened and hard-armored to reduce erosion.

Cities and towns are rife with hard surfaces such as roads, parking lots, sidewalks, and roofs. These surfaces are referred to as "impervious surfaces" – rain that falls on these surfaces runs off through overland flow instead of infiltrating through the soil to slowly recharge nearby waterbodies. The result of moving water off the land more quickly than natural is "flashy" streams – those that very quickly receive water (through an infrastructure of drainage pipes or through overland flow) and fill their banks, but transport water so efficiently that low flow conditions are once again achieved in an unnaturally fast recovery. Flashy streams can contribute flooding to their adjacent landscapes, as well as downstream. Aquatic life does not adapt well to flashy

streams. Substrate is scoured away relatively quickly, banks are eroded, sediment is deposited on top of remaining substrate, and water levels are highly variable. In warm weather, the water flowing over impervious surfaces picks up heat from those surfaces and adds thermal pollution to receiving waters. This effect is exacerbated by a lack of canopy cover from shallow or non-existent riparian buffers that expose water to direct sunlight, further raising the temperature.

Other

Man has been harnessing the power of moving water to perform work for centuries. Today, Indiana still uses the power of rivers to produce energy through the workings of hydroelectric dams. Five hydroelectric dams are on-line in Indiana, providing 32 GWh of power to Indiana per year (U.S. EIA 2012).

Hydroelectric Dam	**Waterbody**	**Owner**
Norway Dam	Lake Schafer	NIPSCO
Oakdale Dam	Lake Freeman	NIPSCO
Twin Branch Dam	St. Joseph River (Lake MI)	Indiana-Michigan Power
Elkhart Dam	Elkhart River	Indiana-Michigan Power
Markland Locks and Dam	Ohio River	Duke Energy

Table 7. Hydroelectric Dams in Indiana.

Small lowhead dams are also a part of Indiana's hydromodification history. These dams often powered grist and wood mills in the early years of Indiana's statehood. However, once the mills were taken out of service, the lowhead dams often were not removed. Lowhead dams are a barrier to fish migration, collect sediment and contaminants behind them, and endanger paddlers and other persons recreating on the water. They also crumble and break down, creating swift velocities through notches in the dam, and potentially transporting contaminated sediments downstream. Perhaps the biggest challenge of lowhead dams is that they are expensive to remove and often the party that originally installed the dam no longer exists. Through its National Inventory of Dams, the USACE reports that there are 927 known dams in Indiana; 272 of those dams are rated "high hazard potential." There is no statewide initiative to remove these dams.

Figure 13. Lowhead dam and bridge over the Patoka River in Dubois County.

Uncompleted projects

The 2012 GAO report to Congress on the national NPS program indicates that, nationwide, nearly 30% of projects funded with 319 dollars are not able to accomplish the proposed goals of their project. Indiana's projects are no exception to this. In FFY '07 and '08 (the last grant years to have closed out), a total of $513,929 in 319 dollars were returned to the state to be reprogrammed due to grantees being unable to spend all of the money that they had requested. In response to this phenomenon, extensive efforts are made during the Request for Proposals process to ensure that 319 funds will be awarded only to potentially successful projects. In order to be granted 319 funds, groups must make the case that they have the right partners on board to deal with their particular water quality problems and sources. Recently, successful implementation proposals have included letters of commitment from landowners who would put practices on the ground to abate NPS. WSS work with these groups long before proposals are due in order to ensure that the projects proposed are feasible and of water quality benefit. Still, circumstances beyond the control of the grantee (e.g. a wet or drought year; land changing hands; sudden loss of the watershed coordinator) may keep them from expending funds allocated to their project.

Measuring Success

The past five years have seen an increased emphasis on measuring and reporting success at the state and regional levels. U.S. EPA included strong, numeric, achievable success measures in both its 2006-2011 and 2011-2015 strategic plans, including milestones that were passed on to states. Two of those measures, SP-12 and WQ-10, are particularly relevant to the state NPS program. Measure SP-12 (also referred to as "Measure W") requires states to report on 12-digit watershed improvements as compared to the 2002 303(d) List of Impaired Waters. From FFY07 to FFY12, Indiana was tasked with showing success in at least five 12-digit watersheds. Despite inherent difficulties with using the 2002 303(d) list as the baseline upon which improvements would be measured, Indiana was able to meet its commitment of documenting improved water quality of six watersheds in that time period (Table 6).

WQ-10 (or "Success Stories") is a reach-related measure indicating miles or acres of fully or partially-restored waterbodies that were listed on any state 303(d) list for NPS causes and for which Section 319 money was expended. Again, the target was set for showing improvements in five segments in the five year period 2007-2012.

While IDEM NPS has been able to work with its partners to report successes to U.S. EPA as requested, there still remains some difficult points that continue to hinder the ability of IDEM to show improvement in water quality. One of those hindrances is the continued use of 2002 as the base year against which improvement is measured. This is problematic, as data collection and list development processes were still evolving for the 2002 list year. In addition, many more impairments for NPS have been added to the lists since that time. Until U.S. EPA can allow flexibility in base year against which to show Measure W improvements, the finding and reporting of success measures will consume continually more 319 funds for staff time.

In addition, from a success reporting perspective, it presents a difficulty that the Food, Conservation, and Energy Act of 2008 (P.L. 110-234, Sec. 1619) specifically prohibits NRCS and FSA from disclosing the geospatial references of land related to program participants, except in limited circumstances or in aggregate. Because IDEM's NPS program has not negotiated a Memorandum of Understanding (MOU) with Indiana's USDA office for the release of georeferenced information

in order to report to U.S. EPA, it is difficult for IDEM NPS to associate conservation practices installed under USDA programs with stream improvement for WQ-10.

Finally, reporting measures of success is a challenge for IDEM as it requires baseline monitoring against which subsequent equivalent monitoring can be evaluated. IDEM shows successes by using the "delisting option" for showing improvement (U.S. EPA 2008b). However, in order to list and delist stream segments, data must be collected at the Level 3 data quality objective level (IDEM 2013). The result of this need is that IDEM can only delist a stream segment where IDEM has already performed baseline monitoring. This becomes a difficult proposition when the state is tied to the FFY2002 303(d) list, as there simply weren't as many sites sampled in a given watershed at that time. In order to correct this issue, IDEM has begun baseline sampling for a limited number of watershed groups undertaking planning activities. These watersheds will be targeted for follow-up monitoring after a sufficient implementation period has elapsed.

Clarification of Policy for Watershed Management Planning Activities

Watershed groups in Indiana continue to struggle with the identification of critical areas for their WMPs. Critical areas are required to be included in the plan before the plan can be approved by IDEM. A systematic guidance for critical areas determinations has not been provided by IDEM, even though it is clearly needed (IDEM 2011). In addition, some groups working on older plans that have been implemented for several years are seeing the need to update or revise their WMP. IDEM has not clearly stated how it will ask projects to provide those updates. IDEM needs to provide guidance for WMP revision and critical area updates when groups find additional NPS problems or have exhausted their list of landowners willing to install BMPs.

Prioritizing Waters

The Indiana Department of Environmental Management (IDEM) Nonpoint Source (NPS) program began a prioritization process to target its Section 319 funding in 1997. At that time, a committee consisting of IDEM's nonpoint source partners analyzed available data to formulate twelve priority sources of NPS for funding. These priorities were included in the 1999 State NPS Management Plan:

1. agricultural production;
2. streambank/shoreline erosion and aquatic habitat degradation;
3. land application of non-agricultural wastes;
4. timber harvesting and loss of forest lands;
5. land development;
6. on-site sewage disposal;
7. landfills;
8. transportation;
9. coal mining;
10. oil and gas production;
11. non-energy mineral extraction; and
12. atmospheric deposition.

In the FFY 2006 grant cycle, the Indiana NPS program prioritized waters impaired by NPS for Section 205j and 319(h) funding. Since that time, the following three priorities have guided the expenditure of NPS funds:

1. Watershed management planning in watersheds with waterbodies on the current 303(d) list.
2. Watershed management planning/implementation in watersheds with completed Total Maximum Daily Load reports (TMDLs).
3. Watershed implementation in watersheds with plans that meet U.S. Environmental Protection Agency's (EPA) 9 Elements and IDEM's current checklist.

In FFY 2013, IDEM NPS further targeted the expenditure of its grant funds to priority geographical areas: the Lake Michigan Coastal Zone (hydrologic unit code (HUC) 04040001), waters of the Wabash River watershed (HUCs 05120101-05120113), and waters of the East Fork White River watershed (HUCs 05120204-08). The purpose of this geographical targeting was to align the state's limited NPS funding with the conditionally-approved Lake Michigan Coastal Program's Nonpoint Control Program (LMCP) and the goals of the Indiana Conservation Partnership (ICP).

With shrinking federal funding and an emphasis on showing success, IDEM has determined that it needs to even further refine its funding priorities. IDEM identified several approaches by which it could prioritize its funding, as well as the advantages and disadvantages of each.

Approach #1. Use the 303(d)/consolidated list (e.g. "stay the course")

Pros:	Cons:
NPS program does not have to develop anything new	Moving target (new waters are added and waters removed each list cycle)
Takes into consideration scientifically-defensible water quality monitoring	Only reports on parameters that Indiana has a standard or CALM methodology for (others represented by surrogate, such as IBC)
Is an objective tool that either identifies waters as impaired or not (or not enough info)	Specifies stream segments, not watersheds– if a particular monitoring site is located on a large waterbody, the results cannot be extrapolated back to any particular feeding stream. Vice versa with headwater and receiving streams. To diagnose NPS sources in a watershed, need characterization monitoring, not scatter-shot sampling sites

Table 8. Prioritization Approach #1 Decision Table.

Approach #2. Prioritize by source (e.g. conventionally tilled fields, livestock with stream access, denuded stream banks, eroding stream banks)

Pros:	Cons:
More waterbodies of the state than using the 303(d)/consolidated list alone	Sources are very widespread. Likely that further prioritization within these sources would be necessary.
Address more sources than through using the 303(d)/consolidated list alone	Not targeted to provide demonstrable success through easy monitoring procedures
Likely that some place in every part of the state will be eligible (i.e. more real estate would be eligible than using HUCs or stream reach IDs to prioritize) – more politically tenable	Might perpetuate condition in which implementation of BMPs is so spread out, improvements in water quality cannot be observed for many years
More in-line with other funding sources/mechanisms (EQIP, WRP, USFWS funds, etc)	Many sources in a given watershed – would each source be given equal weight? Would all sources be addressable at any given time?
Could build statewide outreach on particular sources	

Table 9. Prioritization Approach #2 Decision Table.

Approach #3. Prioritize implementation of current plans only

Pros:	Cons:
Provide focus on implementation, as is emphasized in the 2013 EPA guidelines	Might still be too spread out to show success; may still have to prioritize certain geographical locations
Might provide a catalyst for groups to find a way to fund planning using dollars other than 319	Watersheds building momentum for planning may be stifled
	Political backlash

Table 10. Prioritization Approach #3 Decision Table.

Approach #4. Only provide funding for local project staff, not cost share (i.e. fund outreach, monitoring, planning, and coordination-related tasks)

Pros:	Cons:
More projects funded, even with limited dollars	Everybody is going to want to fund staff – lots of applications for a little bit of money
Leverages funding with other, more robust cost-share programs (319 funds staff – Farm Bill and USFWS programs typically do not fund staff)	Inter-watershed wars – each county (or SWCD) in a watershed might want their own "coordinator"
	It is possible that less BMPs will be funded
	There is no guarantee that there will be funding available for cost-share – could be funding staff with no/limited funds available for implementation.

Table 11. Prioritization Approach #4 Decision Table.

Approach #5. Prioritize areas with no planning for planning
This approach is not feasible if 50% of the 319 allocation is to go to implementation

Approach #6. Use state/federal prioritizations already in place for MRBI, GLRI, endangered species, OSRWs, others.

Pros:	Cons:
Work of prioritization has already been done, for programs similar in scope and need	Does not take into consideration 319-specific needs such as working in critical areas or developing a plan before providing cost-share funds
Leverages the funds that are being provided by special initiatives with 319 funding	It is possible that over-saturation of funding will occur where more money is dedicated to a geographic area than that area can obligate within the allotted timeframe
	It is possible that no stakeholders from these areas will apply for 319 funds
	There are watersheds (eg, OH River) not covered by these initiatives that have water quality issues as well

Table 12. Prioritization Approach #6 Decision Table.

Approach #7. Prioritize using the U.S. EPA's Recovery Potential Tool.

Pros:	Cons:
Science-based analysis of areas in need of restoration – prioritizes those areas most likely to recover	Data is not equally available for all parts of the analysis
Flexibility of scale - the analysis can be large (8-digit) or small (12-digit)	Priority data may differ across the state (i.e. slope may be more of a factor in southern and western IN than eastern and central IN)

Table 13. Prioritization Approach #7 Decision Table.

IDEM has chosen to use a combination of Approaches #1, 2, 6, and 7 to develop a hierarchy of prioritized waters. Development of the prioritization scheme will progress as follows:

FFY 2013 & 2014: IDEM will continue to use the 2006 priorities (impaired waters, waters with TMDL, and waters with an approved management plan), with additional emphasis on implementation in the Coastal Nonpoint Program Area and the Wabash River and East Fork White River basins and priority watersheds described in the State Nutrient Reduction Strategy.

FFY 2013: IDEM will pilot the U.S. EPA's Recovery Potential Tool (RPT) as a part of its TMDL program and evaluate its potential utility in prioritizing Indiana waters for NPS funding.

FFY 2015: IDEM will embark on identifying a prioritization exercise with other agencies and organizations involved in the ICP. The anticipated output of this process will be a list and/or map of specific geographic watersheds that all partners in the ICP agree to be a priority for NPS funding opportunities that may become available to the partnership. While this process is intended to identify the most critical watersheds, it will not assign a priority ranking to all watersheds in the state.

FFY 2017: IDEM will have developed a list of priority waters or NPS causes/sources to address through its NPS funding.

Goals and Management Measures

The Indiana Department of Environmental Management's (IDEM) Nonpoint Source (NPS) Management Plan is a vision and mission-driven strategy. All goals, objectives, milestones, and measures of success are based upon these two statements.

Program Vision:
The vision of Indiana's Nonpoint Source Program is to restore waters impaired by NPS pollution and maintain water quality in healthy watersheds through locally led partnerships.

Mission: "To work with our partners to make measurable improvements in, and prevent degradation of, water quality by addressing NPS pollution through education, planning, and implementation."

Because NPS results from run-off across the landscape, it is best dealt with using a *watershed approach*. The "watershed approach" is a method of strategically addressing water pollution which takes into account all sources of point source and NPS pollution in a watershed and engages all stakeholders of the geographic region through the watershed planning process. It provides a framework for coordinating and integrating the myriad programs and resources available to stakeholders in the watershed. The watershed approach is based on four basic principles:

1. Geographic focus, based on hydrological rather than political boundaries.
2. Water quality objectives based on scientific data.
3. Coordinated priorities and integrated solutions.
4. Diverse, well-integrated partnerships.

Vision:
The vision of Indiana's Nonpoint Source Program is to restore waters impaired by NPS pollution and maintain water quality in healthy watersheds through locally led partnerships.

Mission: "To work with our partners to make measurable improvements in, and prevent degradation of, water quality by addressing NPS pollution through education, planning, and implementation."

In the past, IDEM's NPS program emphasized the use of a watershed approach for local projects, but the agency did not mimic this approach on a statewide level. In the next five years, the NPS program proposes to more purposefully use a watershed approach to restoring and protecting water quality in the state. For FFY 2013-2014, Section 319 funds have been targeted to reduce nutrient loadings in the Wabash and East Fork White River basins. In 2015 through 2018, IDEM plans to work with partners to build consensus on data-driven statewide priority watersheds where NPS resources can be focused. IDEM will bring to the process water quality data and an analysis of recovery potential for particular hydrologic areas. The IDEM Watershed Planning and Restoration Section will utilize the U.S. Environmental Protection Agency's (U. S. EPA) Recovery Potential Tool (RPT) to develop Total Maximum Daily Loads (TMDLs) reports with the maximum potential to recover, as well as to integrate TMDLs and watershed planning activities, both through baseline monitoring and through the use of the TMDL-Watershed Management Plan (WMP) template.

The Goals of this State NPS Management Plan are very similar to the goals of any given WMP approved in the state of Indiana. This Plan proposes to form and utilize partnerships to define and address NPS issues; monitor the status of those issues; provide outreach and education to citizens of the state to raise awareness of NPS issues; remediate the causes and sources of NPS; and protect areas already meeting water quality standards and those areas threatened by NPS. Proposed short-, medium-, and long-term objectives outlined under each of these broad goals are categorized as "programmatic," "financial," and "technical."

Goal 1: Utilize partnerships to leverage resources available for NPS management.

Cooperation with state, federal, local, and private partners is critical to Indiana's NPS program. IDEM believes that coordinating with these partners increases the funds, staff, physical resources (buildings, landholdings, etc), and political capital available to Indiana's work on NPS issues. IDEM has allied itself, and will continue to collaborate, with numerous agencies and organizations in the pursuit of cleaner water. Many of IDEM's internal and external partners were described in the "Stakeholders" section and other sections of this document. However, over the next five years, several significant joint efforts between state and federal agencies and IDEM will be taking place and warrant special recognition within this strategy.

U.S. EPA/USDA and the National Water Quality Initiative

In FFY 2012, the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) and U.S. EPA collaborated on a national effort to increase agricultural BMPs in critical watersheds. This effort was called the National Water Quality Initiative (NWQI). Five percent of each state's Environmental Quality Incentives Program (EQIP) funds were to be dedicated to one to three priority 12-digit watersheds with a goal of showing water quality improvement. In Indiana, NRCS coordinated with IDEM to choose three watersheds that were: impaired (listed on the 2008 303(d) list) for pollutants associated with agricultural run-off; were largely agricultural in land use; identified as critical areas in IDEM-approved watershed management plans; had a currently-active locally-led watershed group; where there was a perceived willingness of producers to implement BMPs through EQIP; and where a strong monitoring program was in place to measure change. The three 12-digit hydrologic unit code (HUC) watersheds chosen were Silver Creek (HUC 051201040501), Ell Creek (HUC 051202090405) and Eagle Creek (HUC 051202011108).

In FFY 2013, NRCS continued implementing in the three watersheds chosen to be a part of the NWQI in FFY 2012. IDEM is currently coordinating with NRCS to allow for appropriate water quality monitoring in selected watersheds. In future years that the NWQI is implemented, IDEM foresees working closely with NRCS to evaluate effectiveness of the program and consider adaptive management practices as they are warranted.

Coordinating with CWSRF to address NPS

The Clean Water State Revolving Fund (CWSRF) NPS program has been providing state match for the Section 319 grant through recycled state funds since 2005. Eligible projects for SRF funding and 319 match include:

- Wetland restoration/protection;
- Erosion control measures – vegetative and structural or non-structural;
- Ground water remediation;
- Failing septic system – repair, replacement or connection to sewer;
- Storm Water Phase II (Rule 13) best management practices (BMPs);
- Source water and wellhead protection measures;
- Brownfield Remediation with water quality benefits;
- Conservation easements; and
- Agricultural and waste management BMPs.

Indiana's CWSRF-NPS program works in conjunction with its loan program and all NPS projects must be tied to a CWSRF loan. Loan project applicants are encouraged to include a NPS component through an interest rate reduction of up to 0.5%, which generally covers the cost of the NPS project. Additionally, those projects that include NPS components in their loan applications increase their project priority score which moves the project higher on the list for funding.

The IDEM NPS program is seeking increased coordination with the CWSRF-NPS program in order to address the challenge of decreasing funds for nonpoint source projects. While WMPs have been used by CWSRF-NPS to document need for a particular project, a strong link between the two programs has not been established. The NPS program has proposed to provide CWSRF with a fact-sheet about the Section 319 program and watershed management plans that might inform a CWSRF-NPS project. In addition, the CWSRF program holds a planning meeting for most potential loan applicants. NPS projects are encouraged at this first meeting of the SRF program and program applicants. IDEM NPS has suggested that WSS might be available at some of those meetings to provide information regarding local watershed groups, WMPs or related efforts so that NPS projects are placed in the most critical areas of the landscape.

Working with the Lake Michigan Coastal Program

Because Indiana contains 59 miles of Lake Michigan shoreline, the state is eligible to participate in the National Oceanic and Atmospheric Administration's (NOAA) Coastal Zone Management Program (authorized through the CZMA of 1972). The Indiana Department of Natural Resources (IDNR), Division of Nature Preserves administers the program on behalf of the State. Indiana submitted its Lake Michigan Coastal Program (LMCP) Document/Final Environmental Impact Statement – covering 604 square miles of land and 241 square miles of the lake itself – to NOAA for approval in 2002. It was approved the same year. The Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 includes a requirement for all states who participate in the Coastal Zone Management Program to institute a Coastal Nonpoint Control Program (CNPCP) as a part of their CZM program. This program was not intended to supersede the CZMA or Section 319 programs, but to work as a supplement to these programs. Federally, the CNPCP is jointly administered by NOAA and U.S. EPA, who provide approval of CNPCPs for CZARA and Section 319 funding.

Indiana received conditional approval of its 2005 draft CNPCP submission to NOAA and U.S. EPA in 2005. The draft program detailed how Indiana would meet the 55 management measures provided through NOAA/EPA guidance. After working with local, state, and federal partners, the LMCP submitted a revised CNPCP to NOAA and U.S. EPA in late 2012, in which several of the

2005 conditions were satisfied. Several more remain (Appendix J). U.S. EPA has directed the IDEM NPS Program to allocate at least $100,000 per year of Section 319 funding to the Coastal Zone until the remaining conditions are satisfied. Projects funded for this purpose shall be jointly developed by LMCP and Section 319 Staff. LMCP and Section 319 staff shall work with local partners to identify specific projects that satisfy additional management measures an example of a potential project is modeling to demonstrate BMP effectiveness.

In addition to the $100,000 Section 319 allocation to the Coastal Zone, IDEM intends to coordinate with the LMCP to obtain full approval of its CNPCP. In FFY 2013, IDEM participated in coordination meetings with the LMCP and has agreed to author portions of the CNPCP program document that directly relate to IDEM's programs that may be used to satisfy Section 6217 requirements. The partners set FFY2018 as the target to address all remaining outstanding Section 6217 management measures.

IDEM Section 319 program requires WMPs funded with 319 funds in the Coastal Zone to meet Section 6217 requirements. Section 319 implementation funds awarded to the region must be used to improve critical areas identified in the WMP (equivalent to "critical coastal areas" for the purposes of 6217) which may include (but is not limited to) providing cost-share dollars and technical assistance to install BMPs, conducting an outreach and education program to raise awareness of NPS issues and critical coastal areas, and administrative funding to hire staff and administer the grant. Approved Coastal Zone WMPs are incorporated in this Plan by reference (Appendix F). For FFY 2013-2016, IDEM has a grant agreement in place with the LaPorte County Soil and Water Conservation District (SWCD) to implement the Trail Creek WMP. In addition, IDEM has proposed to U.S. EPA to use FFY 2013 Section 319 funds to grant the Northwest Indiana Regional Plan Commission's (NIRPC) proposal to draft and implement a WMP for the Deep River watershed for FFY 2013-2017. Approval of the grant package by U.S. EPA is pending. Additional proposals for planning and implementation in the Coastal Zone will be considered as they are received during the solicitation period.

IDEM will track all 319 projects, including those in the Coastal Zone, in the Grants Reporting and Tracking System (GRTS) and will report on load reductions in its NPS annual report. Specific segments listed and delisted will appear on a biannual basis via the Integrated Report and the 303(d) List of Impaired Waters. The DNR LMCP will provide additional documentation of progress made to NOAA and EPA as it is required.

Indiana's State Nutrient Reduction Strategy

The Indiana State Department of Agriculture (ISDA) is Indiana's representative on the Gulf of Mexico Hypoxia Task Force. This agency has been charged with preparing Indiana's Nutrient Reduction Strategy ("the Strategy"), both for the Mississippi and Great Lakes basins. As the state water quality agency designated by U.S. EPA to administer CWA programs, IDEM is participating in the work group to prepare the Strategy, as well as taking an active role in authoring portions of the document. A final draft Strategy was submitted to U.S. EPA in the second quarter of 2013. It will be released for public comment and the committee awaits comment from U.S. EPA.

Individual Goal 1 objectives are outlined below.

Objectives

Programmatic Objectives

- Work with LMCP to gain full approval of all outstanding measures on the LMCP plan. (FFY 2013-2018)
- Complete the Deep River TMDL and WMP. (FFY 2013-2015)
- Restore and protect water quality in critical areas of coastal WMPs.
    - Trail Creek: FFY 2013-14
    - Deep River: FFY 2015-2017
    - Salt Creek: FFY TBD
- Support the Conservation Reserve Enhancement Program (CREP), Mississippi River Basin Initiative (MRBI), Great Lakes Restoration Initiative (GLRI), Lake and River Enhancement (LARE), Clean Water Indiana (CWI), and other Indiana Conservation Partnership (ICP) and statewide initiatives as they become available by:
    - Promoting the programs through the watershed specialists (WSS) and including them in relevant TMDLs as methods for implementation. (FFY 2013-2018)
    - Funding ISDA technicians to design and implement BMPs in select watersheds. (FFY 2013-2015)
- Utilize the ICP as an advisory group for priority NPS policies and updates. (FFY 2013-2018)
- Continue to provide technical assistance to local watershed groups through the WSS or project manager. (FFY 2013-2018)
- Utilize the TMDL-WMP template for TMDLs written in 2014 and beyond. (FFY 2014-2018)
- Continue to partner with the NRCS on the National Water Quality Initiative (NWQI) for as long as the Initiative remains a national priority. (FFY 2013-2018)
- Support implementation of the State Nutrient Reduction Strategy once approved. (FFY 2014-2018)

Financial Objectives

- Dedicate $100,000 in 319 funds to the Coastal Zone (Little Calumet-Galien watershed, HUC 04040001) annually until all of the remaining conditions are met. (FFY 2013-2018)
- Coordinate with CWSRF to link loan applicants and local watershed groups. (FFY 2014-2018)

Technical Objectives

- Work with partners to model, assess, and prioritize critical watersheds in the state. (FFY 2015-2018)
- Use current IDEM WSS to assist partners with NPS planning and implementation activities. (FFY 2013-2018)

Goal 2: Monitor and assess Indiana waters for NPS impairments and improvements.

IDEM's strategy for monitoring water quality in the state, including the status of NPS, is described in the *Indiana Water Quality Monitoring Strategy 2011-2019* (WQMS). Broadly, IDEM will use the following types of monitoring to evaluate and characterize NPS in the state:

- Probabilistic monitoring – characterization of water quality throughout the entire state (lakes, rivers, and streams) through statistically-valid sampling using a rotating basins approach to categorize the causes and sources of pollution.
- Baseline monitoring – characterization of a smaller watershed (used in conjunction with a TMDL process when possible) that will allow for follow-up monitoring after restoration activities have been implemented.
- Success monitoring – follow-up monitoring after restoration activities have taken place to evaluate the water quality (e.g. Measures SP-12 and WQ-10) as compared to baseline water quality.
- Special projects – projects necessary to develop water quality criteria to include in Indiana's water quality standards; to characterize nutrient loads of Indiana waters that contribute NPS to the Gulf of Mexico and the Great Lakes; to develop TMDLs; to participate in national initiatives, such as the U.S. EPA's National Aquatic Resource Surveys (NARS) and the NWQI; and other priority projects as opportunities become available.

In addition, NPS program grantees often monitor water quality in their watersheds of interest, utilizing a variety of methods. IDEM has issued a Monitoring Handbook (Frankenberger and Esman 2012) outlining the core indicators that all NPS grant project must include if they are going to conduct water quality monitoring and a number of supplemental indicators that they can monitor as well depending on their project needs. Different methods for monitoring these indicators are suggested in the handbook, but specific methods are not required. Many groups use Hoosier Riverwatch (Indiana's citizen monitoring program) methods to conduct their water quality monitoring and to raise stakeholder awareness of water quality in their watersheds. In fact, so many groups utilize Hoosier Riverwatch that a standardized Quality Assurance Project Plan (QAPP) is now being developed to be used as a template for NPS grantees. With the shift of the Hoosier Riverwatch program from the IDNR to the IDEM, IDEM NPS has taken responsibility for continuing to train groups in and hosting the web-based Hoosier Riverwatch database database which serves as a repository for water quality monitoring data collected by volunteers trained through the program. IDEM's NPS program also funds a similar program for volunteer monitoring of Indiana lakes. Indiana's Clean Lakes Program, is administered through Indiana University-Bloomington (IU) and funded through a CWA Section 319 grant.

IDEM also will be participating in several special NPS monitoring projects in the next five years. Nationally, IDEM will be monitoring for NWQI watersheds and participating in the NARS. In 2010-2015 205j funds are being used to support monitoring on the Wabash River at the New Harmony bridge to characterize Indiana's nutrient loads to the Ohio River, and ultimately, the Gulf of Mexico.

Water quality monitoring alone will not improve water quality conditions in Indiana. The information generated through monitoring efforts must be converted into effective decision-making. Sometimes that requires modeling to interpolate and extrapolate for conditions that are not reflected in the monitoring effort or to integrate collected data into a decision-making framework. Specific modeling efforts that will be undertaken by IDEM in the next five years includes use of the U.S. EPA's RPT to gage which waters should receive limited resources available and the load/flow duration curves for TMDL development. IDEM will also be increasing its capacity to assess NPS in the state through work on the External Data Framework (EDF), a program that will allow IDEM to use data collected by partners to its fullest potential. As a long-term goal, the NPS program aspires to revisit statewide land use, water quality data, assessments and modeling, as well as integrate what partners and local groups are finding as to what is critical, to update the NPS assessment completed in 1989 and perhaps refine the sources & magnitude of NPS in the state. Finally, IDEM will reinvigorate its internal BMPs mapping project – a tool that will create a GIS layer of all Indiana's Section 319 BMP implementation locations.

Objectives

Programmatic Objectives

- Require the use of the Environmental Monitoring for Watershed Groups handbook for 319 grantees. (FFY 2013-2018)
- Coordinate with NRCS to develop a sampling regime for NWQI projects. (FFY 2013-2014)
- Continue to implement the import of 319 grantee data into NPS-AIMS. (FFY 2013-2018)
- Invite the participation of local project leaders when conducting 305(b) CWA assessments on baseline monitoring data. (FFY 2013-2018)
- Long-term: Revisit the way in which we characterize the sources and magnitude of NPS-impaired waters - revisit statewide land use, water quality data, assessments and modeling, as well as what partners and local groups are finding as to what is critical, to update the original 1989 assessment and perhaps refine the sources & magnitude of NPS in the state.

Financial Objectives

- Continue to fund the Clean Lakes Program (volunteer and professional) data collection for use in 305(b) and 314 assessments and 303(d) listing. (FFY 2013-2018)
- Direct IDEM resources to perform baseline characterization monitoring of at least one watershed annually to support TMDL and watershed planning efforts.
  Measures:
  2013 – Deep River TMDL and WMP2014 – Lower Whitewater TMDL and WMP
  2015-2017 – TBD.
- Utilize Section 319 funding to monitor waterbodies identified as targets of the National Water Quality Initiative as described in the sampling design developed by IDEM and NRCS. (FFY 2015-2018)

Technical Objectives

- Integrate Hoosier Riverwatch voluntary monitoring program into IDEM's monitoring and assessment schemas.
  - Complete Hoosier Riverwatch QAPP. (FFY 2014)
  - Provide support for 20 Hoosier Riverwatch workshops (volunteer trainings) and maintain current loaner/teaching trunks. (FFY 2013-2018)

    - Provide support for maintenance of the Hoosier Riverwatch water quality monitoring database and associated websites. (FFY 2013-2018)
- Complete acceptance criteria for EDF. (FFY 2014)
- Complete the development of technical assistance materials for the EDF and web site development to support its implementation. (FFY 2014)
- Begin accepting, reviewing and ranking water quality data provided by external organizations and, if appropriate, using the data to make 305(b)/303(d) water quality assessment and listing decisions. (FFY 2014)
- Evaluate water quality data to identify watersheds that should be surveyed for possible NPS water quality improvements. – annually (FFY 2013-2018)
- Use additional resources (e.g., staff, funds, and technical support) to monitor water quality in watersheds where NPS restoration activities have occurred. The monitoring data will be compared to baseline information, if available, to gauge the efficacy of the work. – annually. (FFY 2013-2018)
- Utilize probabilistic monitoring, along with some targeted monitoring, to determine water quality improvements in the coastal zone. (FFY 2018)
- Continue groundwater (GW)/source water monitoring through Section 106 funding. (FFY 2013-2018)
- Long-term goal: Analyze the findings of all ground water data taken by the state to characterize the causes, sources, and magnitude of NPS in ground water

Goal 3: Develop and conduct a strategic outreach and education program.

Despite the fact that NPS remains the biggest water quality threat to the nation, 70% of participants with a high-school or "some college" education could not define "watershed" in a regional survey of the Chesapeake Bay watershed (McClafferty 2002)[11]. This statistic suggests that raising awareness of NPS issues among the general public continues to be an important issue that should be addressed by water quality agencies and organizations. In Indiana, the opportunity to work with partners on a unified message regarding NPS is great. IDEM realizes that any messaging campaign undertaken with partners needs to be consistent across the state. Indiana does not have the resources to provide conflicting or redundant information. In the next five years, IDEM plans to start a discussion on messaging with its partners (starting with the ICP) towards the long-term goal of defining and implementing a statewide campaign that is agreed upon by all major NPS partners.

In the interim, IDEM will continue to utilize strong components of its current program. IDEM's NPS website, in particular, will continue to be updated and promoted to target audiences such as NPS grantees and partners. IDEM will also continue to work with partners on training initiatives, such as the Indiana Watershed Leadership Academy (IWLA; through Purdue University) and the ICP's Training and Certification Program for ICP staff. In addition, IDEM will continue to utilize the NPS staff to engage interested groups and communities, through direct contacts, conference attendance, involvement in statewide and regional committees, and webinar and other training opportunities, as well as updating current educational pieces.

Some outreach mechanisms that IDEM could develop or improve include social media presence (such as posting NPS information on the IDEM Facebook page/develop tweets for the Twitter account), source-directed literature, contributing articles/information to partner newsletters and publications upon request (as resources allow), and possibly updating the Pathway to Water Quality exhibit at the Indiana State Fairgrounds.

Objectives

Programmatic Objectives

- Highlight successes of the program, including successful grantees and other partners
    - Produce five "Success Stories" (EPA WQ-10 Strategic Measure) by 2018 and publicize widely within Indiana. (FFY 2013-2018)
    - Publicize any awards given to watershed groups related to their water quality efforts in Indiana. (FFY 2013-2018)
- Annually review print materials for updates and reprint as needed. (FFY 2013-2018)
- Continue to provide citizen monitoring training through Hoosier Riverwatch and the Clean Lakes Program. (FFY 2013-2018)
- Outreach on on-site disposal (or, septic) systems in the Lake Michigan Coastal Zone

[11] When compared to the general public, the population surveyed for this study contained fewer males, was more educated, and was wealthier overall. Given these parameters, it is possible that a similar survey of Indiana residents would result in fewer correct answers to the definition of a "watershed."

    - Market on-site disposal system inspections at property transfer to lending institutions in the Coastal Zone. (FFY 2013-2018)
    - Work with partners to develop Septic Awareness Campaign regarding septic impacts. Items may include developing Public Service Announcements regarding the importance of proper on-site disposal system maintenance. (FFY 2013-2018)
    - Promote the use of the Revolving Loan Fund for Septic upgrades and repairs. (FFY 2018)
- Provide cost-effective outreach to audiences in Indiana.
    - Utilize social media to provide up-to-the minute information to followers of IDEM's social media outlets. (FFY 2013-2018)
    - Work with other ICP organizations to strategize about outreach to absentee landowners. (FFY 2015-2018).
    - Continue to participate in the Pathway to Water Quality at the Indiana State Fairgrounds. (FFY 2013-2018)
- Continue outreach to the community of County Surveyors to become involved in water quality improvement through the IWLA, the Indiana Association of County Surveyors, local watershed groups, and county contacts. (FFY 2013-2018).
- Long-term goal: Work with partners to develop a statewide NPS marketing campaign including widely disseminated materials such as statewide commercials/billboards
    - Work with partners to define the purpose of the outreach program.
    - Work with partners to identify the target audience.
    - Work with partners to develop a consistent statewide message.
    - Publicize success stories through multiple media applications.
    - Support technical events to exchange information between government partners, watershed groups, and citizens.

Financial Objectives

- Long-term goal: use 319 funds to leverage for partner-based statewide marketing campaign including widely disseminated materials such as statewide television/radio commercials/billboards.

Technical Objectives

- Continue to build capacity for water quality improvement in the state.
    - Continue to provide technical assistance to Purdue University's Indiana Watershed Leadership Academy. (FFY 2013-2018)
    - Continue to support the ICP's Training and Certification Program on watershed related issues by sitting on the Technical Research Board and the advisory team. (FFY 2013-2018)
- Work with U.S. EPA to identify non-9-Elements Plans (such as TMDLs, Source Water Assessment Plans (SWAPs), etc.) that can be implemented using 319 funds and pursue outreach goals identified therein.

Goal 4: Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions.

The heart of Indiana's NPS program is its effort to restore waterbodies polluted by NPS. The state's land use and hydrology have been highly modified by human activity. It is not the intention of the NPS program to attempt to revert to the pre-colonial land use and hydrological regime, but rather to obtain a balance of uses so that water quality conditions can meet the state's water quality goals of "swimmable" and "fishable."

Many of IDEM's restoration activities take place through grant agreements with state and local partners. Indeed, without these partnerships, IDEM would be hard-pressed to meet its swimmable/fishable goals. Partners leverage Section 205j and Section 319 grant funding with other federal, state, local, and private funding to write and implement watershed management plans that will ultimately improve water quality in Indiana's watersheds.

In the waters of the Coastal Zone, restoration activities undertaken with Section 319 funds will also be in accordance with the CZARA Section 6217 (g) measures. In addition, TMDLs are being written on the TMDL-WMP template that allows watershed groups to easily incorporate TMDL data and streamline the watershed planning process.

Programmatic Objectives

- Capitalize on the monitoring and load-calculations done during TMDL development to inform forthcoming watershed planning projects. (FFY 2013-2018)
    - Utilize TMDLs, when applicable, to jump-start planning projects. (FFY 2013-2018)
    - Utilize the TMDL-WMP template for TMDLs sampled for and written in 2014 and beyond so that they are implementable using 319 funds. (FFY 2014-2018)
    - Prioritize TMDLs for the next five years to give watershed groups an idea of where TMDLs will be pursued. (FFY 2013-2014)
    - Link TMDLs with baseline water monitoring projects for Section 319 watershed management planning applications. (FFY 2013-2018)
- Develop guidance for updating watershed management plans. (FFY 2014-2016)
- Promote integration of watershed management plans with local comprehensive plan. (FFY 2014-2018)
- Identify alternative plans (such as TMDLs, SWAPs, etc.) that could be implemented using 319 funds (FFY 2014) and negotiate with EPA on needed actions to implement those plans using 319 funds (FFY 2017).
- In conjunction with the TMDL program, pilot the RPT in the Deep River, Patoka River and Mississinewa watersheds to prioritize TMDL/WMP activities in the state. (FFY 2013-2015)
- Provide SRF with WSS as contacts for their applicants to pursue NPS projects as a part of their loans – ideally in critical areas as defined by WMPs, if applicable. (FFY 2014)
- Integrate disparate NPS program databases into one centralized integrated Watershed database to assist with tracking and reporting (2018)
    - Develop scope of work for the integrated databases project (FFY 2014-2015)
    - Hire contractor to work on the project (FFY 2015-2018)

Financial

- Use Section 319 funding to support implementation of WMPs that meet the U.S. EPA'S 9 Key Elements of a Watershed Plan (includes staff support and outreach as well as BMPs). Annually (FFY 2013-2018)
- Repair previously-installed BMPs with the caveats outlined in the program policy. (FFY 2013-2018)
- Continue to leverage LARE and CWI funds to address erosion, sedimentation and nutrient input concerns as long as the General Assembly continues to approve appropriations. (FFY 2013-2018)

Technical

- Develop guidance for the identification of critical areas. (FFY 2014)
- Show partial or total restoration in at least five 12-digit watersheds in the next five years. (FFY 2013 - 2018)
- Develop a way to track E. coli load reductions. (FFY 2014)
- Geolocate all BMPs installed through the Section 319 grant program in order to enhance the BMP GIS layer located in the NPS program. (ongoing FFY 2013-2018)
- Solicit for proposals to use Section 319 funding to support implementation of WMPs that meet the U.S. EPA'S 9 Key Elements of a Watershed Plan (includes staff support as well as BMPs) annually. (FFY 2013-2018):
    - Agricultural BMPs: fencing livestock, soil erosion prevention practices, nutrient management practices, *E. coli*-reducing practices, pesticide reduction/management measures, two-stage ditches; rotational/other grazing practices; riparian tree plantings; drainage bioreactors; controlled drainage

    - Urban/residential BMPs: sediment and erosion control/capture practices; nutrient reduction/capture practices; installing rain gardens, rain barrels, pervious concrete/pavement, green roofs, daylighting, swales, and other green infrastructure practices; brownfields ground water remediation that is not under an NPDES permit; local land use ordinances; septic demos, repair/replace, operation and maintenance , and sewer lines from house to street (but not line to wastewater treatment plants (WWTP)/point source)

    - Forestry BMPs: stream bank stabilization; riparian buffer; sediment traps (not in "waters of the state"); road and trail design, construction, maintenance, and closure conforming to standards; water bars; temporary bridges/culverts; seeding skid trails and other eroding areas; fords; diversions; log landings; silt fences

    - (Abandoned) Mining/oil and gas extraction BMPs: erosion controls; grading; lime and other chemicals to treat acid mine drainage; revegetation; phytoremediation; soil amendments; soil removal/disposal; drainage controls; well abandonment; ground water remediation; mine shaft and adit (horizontal tunnel) closings; ditches to divert surface water from mine waste, tailings or mine works; removal and consolidation of small waste piles; removal of large waste piles from water sources; relocation of stream from waste rock dump or tailings pile; capping waste rock piles or tailings with uncontaminated soils followed by revegetation; aeration

and settling ponds to promote precipitation of metals from mine drainage; sulfate-reducing wetlands; oxidation wetlands; passive acid mine drainage treatment facilities; active acid mine drainage treatment facilities; as well as agricultural BMPs to improve soil structure and fertility while reducing erosion, such as:

- Cover Crops – to build soil structure, biomass, and significantly reduce erosion.
- Compaction Avoidance Techniques
- Controlled Traffic Zones (no earlier than year five, maybe later)
- Conservation Crop Rotation – especially those that include long-term crops such as clover and alfalfa
- Contour Farming
- No-till / Conservation Tillage. It is important to note that some tillage may be required in the initial years of production to address settling issues and resulting erosion potential.
- Regrading – Especially important in the initial years of production to address settling issues and resulting erosion potential
- Soil Testing and Variable Rate Applications of Nutrients. Because of changes to soil structure, it may be more effective to use electrical conductivity-based systems (such as Soil Doctor and VERIS) rather than traditional 2.5 acre grid samples.
- Use of animal manures / compost to promote rebuilding of soil structure and organic matter.
- Terraces
- Water and Sediment Control Basins (WASCoBs)
- Grassed Waterways
- Filter Strips / Buffers

Conservation BMPs. Those practices required through permitting may be augmented after bond release:

- Nutrient / Sediment trapping wetlands
- Two-stage ditches / Drainage water management
- Field Buffers
- Wildlife Habitat protection and management

- Aquatic habitat restoration: lowhead dams removal, stream bank stabilization, wetland restoration/creation, National Fish Habitat Program, dredging lakes, natural channel/two-stage ditch/self-forming channel and other restoration designs

Goal 5. Protect sensitive, vulnerable, and high quality waters of the state so that they may continue to meet their designated uses.

Prior to FFY 2013, IDEM's NPS program emphasized the restoration of impaired waters, while the issue of protecting sensitive, threatened, or high-quality waters was largely unrecognized. With the passage and U.S. EPA approval of state antidegradation rules (327 IAC 2-1.3) in 2012, it is only fitting that these waters be considered in the NPS program. For the purposes of this goal, the NPS program considers "sensitive, vulnerable and high quality waters" to include water quality assessment Category 1 waters, watersheds including karst landscapes, outstanding state resource waters (OSRWs – which include national resource waters), drinking water source waters, cold/coolwater/salmonid waters, and waterbodies harboring endangered species.

Category 1 waters are defined by the Integrated Report as those waters that fully support all designated uses and none of its uses are threatened. The definitions of exceptional use, outstanding state resource waters, outstanding national resource waters, and high quality waters of the state are codified at 327 IAC 2-1-11, IC 13-11-2-149.5, IC 13-11-2-149.6, and 327 IAC 2-1.3-2, respectively. Portions of 17 rivers, streams, and Great Lakes have been identified as OSRWs, (Appendix K), and portions of 11 downstate rivers and streams have been identified as Exceptional Use waters. A total of 16 waterbodies are listed in Category 1 of the 2012 consolidated list, three of which are also Exceptional Use waters (Table 14). Eight salmonid streams, 46 surface water source waters, 51 waters harboring habitat for endangered, threatened, or rare (ETR) species, 1410 wellhead protection areas (operated by 681 public water systems), and two major karst landscapes (Mitchell and Muscatatuck Plateaus) are also in need of protection.

COUNTY	HUC12	HUC14	2012 ASSESSMENT UNIT ID	2012 ASSESSMENT UNIT NAME
Decatur	050800030502	05080003050030	ING0352_T1003	Righthand Fork Salt Creek
Franklin	050800030502	05080003050030	ING0352_T1006	Righthand Fork Salt Creek
Ripley	050902030601	05090203070020	INV0372_T1032	Laughery Creek
Ripley	050902030601	05090203070030	INV0373_T1033	Laughery Creek
Clinton	051201070303	05120107040070	INB0733_03	Kilmore Creek
Decatur	051202060301	05120206030010	INW0631_00	Gas Creek and Other Tributaries
Decatur	051202060304	05120206030020	INW0632_00	Lost Creek and Other Tributaries
Jennings	051202070404	05120207050090	INW0759_00	North Fork-Deer Creek
Jennings	051202070404	05120207050090	INW0759_T1011	Vernon Fork, North Fork Water Intake
Jefferson	051202070603	05120207010100	INW071A_01	Big Creek (Downstream of Walton Creek)
Jefferson	051202070603	05120207010120	INW071C_00	Big Creek
Monroe	051202080802	05120208090020	INW0892_00	May Creek and Other Tributaries
Washington	051202081203	05120208150010	INW08F1_T1043	South Fork Lost River
Washington	051202081204	05120208150020	INW08F2_T1042	North Fork Lost River
Orange	051202081204	05120208150030	INW08F3_T1041	Lost River-Carters Creek
Dubois	051202090402	05120209020010	INP0921_T1002	Patoka River

Table 14. 2012 Category 1 waters. Category 1: The waterbody is fully supporting all of its designated uses and none of its uses are threatened. (from http://www.in.gov/idem/nps/2348.htm). Note that the South Fork Lost River (AUID INW08F1_T1043), North Fork Lost River (AUID INW08F2_T1042), and Lost River-Carters Creek (AUID INW08F3_T1041) are also exceptional use streams.

Indiana contains many more impaired waters than high-quality waters. The following lists of watersheds are targeted for protection over the next five years. Priority watersheds may be further limited by the priorities for any particular NPS funding cycle.

HUC 10	Watershed Name	Protected for (1)	Protected for (2)
0404000101	Trail Cr-Frontal Lake MI	salmonids	
0404000102	Galena River	salmonids	
0404000103	Salt Creek	salmonids	
0404000104	East Arm Little Calumet River	salmonids	
0404000106	Calumet River - Frontal Lake MI	salmonids	
0405000108	Fawn River	cisco	
0405000111	Pigeon River	ETR	
0405000113	Mill Creek-St Joseph River	ETR	
0405000115	N Branch Elkhart R	cisco	
0405000119	Elkhart River	ETR	
0405000120	Puterbaugh Creek-St Joseph River	ETR	
0405000121	Baugo Creek	ETR	
0405000122	Brandywine Creek - St. Joseph R	salmonids	
0410000302	W Branch St. Joseph	cisco	
0410000304	Fish Creek	ETR	
0410000307	Cedar Cr	exceptional use	
0410000308	St Joseph River	ETR	Source water

Table 15. Watersheds targeted for protection in the Great Lakes drainage.

HUC 10	Watershed Name	Protected for (1)	Protected for (2)	Protected for (3)
0509020306	Hayes Branch-Laughery Creek	ETR	CAT 1	source water
0509020307	South Fork Laughery Creek-Laughery Creek	ETR		
0509020310	Big Bone Creek-Ohio River	ETR		
0514010103	Corn Creek-Ohio River	ETR		
0514010107	Muddy Fork	source water		
0514010109	Bear Grass Creek-Ohio River	ETR		
0514010401	Otter Creek-Ohio River	ETR		
0514010407	Mill Creek - Blue River	Exceptional Use	source water	
0514010408	Whiskey Run-Blue River	ETR	Exceptional Use	
0514010409	Blue River	ETR	Exceptional Use	
0514010410	Wolf Creek-Ohio River	ETR		
0514020104	Anderson R	source water		
0514020107	Lead Creek-Ohio River	ETR		
0514020108	Pup Creek-Ohio River	ETR		
0514020109	Barren Fork - Little Pigeon Creek	source water		
0514020112	Caney Creek-Ohio River	ETR		
0514020204	Canoe Creek-Ohio River	ETR		

HUC 10	Watershed Name	Protected for (1)	Protected for (2)	Protected for (3)
0514020206	Bayou Creek-Ohio River	ETR		

Table 16. Watersheds targeted for protection in the Ohio Tributaries drainage.

HUC 10	Watershed Name	Protected for (1)	Protected for (2)
0512020101	Muncie Creek - White River	source water	
0512020103	Killbuck Creek-White River	ETR	
0512020108	Geist Reservoir - Fall Creek	source water	
0512020109	Fall creek	source water	
0512020111	Eagle Creek	source water	
0512020203	Plummer Creek	ETR	
0512020210	White River	ETR	
0512020303	Deer Creek	source water	
0512020402	Little Blue River	ETR	
0512020404	Little Sugar Creek-Sugar Creek	ETR	
0512020407	Sugar Creek	ETR	
0512020501	Shankatank Creek-Flatrock River	ETR	
0512020504	Mill Creek-Flatrock River	ETR	source water
0512020603	Sand Creek	CAT 1	source water
0512020605	Thompson Slough - E Fork White	source water	
0512020702	Graham Creek	ETR	
0512020703	Otter Creek	ETR	
0512020704	Brush Creek - Vernon Fork Muscatatuck R	Cat 1	source water
0512020706	White Oak Branch - Muscatatuck R	cat 1	source water
0512020707	Vernon Fork-Muscatatuck River	ETR	
0512020708	Cammie Thomas Ditch	source water	
05120208O1	Twin Creek - East Fork White	source water	
0512020803	Lick Branch - east Fork White	source water	
0512020805	Middle Fork Salt Creek	source water	
0512020807	Lake Monroe - Salt Creek	source water	
0512020808	Salt Creek	cat 1	
05120208l0	Leatherwood Creek-East Fork White River	ETR	source water
05120208l1	Boggs Creek	ETR	
0512020812	Dry Branch - Lost River	Exceptional Use	CAT 1
0512020813	Lost River	Exceptional Use	source water
0512020814	Barn Run-East Fork White River	ETR	
0512020815	East Fork White River	ETR	

Table 17. Watersheds targeted for protection in the White River drainage.

HUC 10	Watershed Name	Protected for (1)	Protected for (2)	Protected for (3)
0512010114	Treaty Creek-Wabash River	ETR		
0512010116	Little Pipe Creek-Wabash	ETR		

HUC 10	Watershed Name	Protected for (1)	Protected for (2)	Protected for (3)
	River			
0512010204	Salamonie River	ETR		
0512010401	Blue River	cisco		
0512010406	Weesau Creek-Eel River	ETR		
0512010407	Eel River	ETR	source water	
0512010501	Crooked Creek-Wabash River	ETR		
0512010502	Rock Creek-Wabash River	ETR		
0512010503	Rattlesnake Creek-Wabash River	ETR		
0512010505	Deer Creek	ETR		
0512010506	Sugar Creek-Wabash River	ETR		
0512010601	Grassy Creek - Tippecanoe River	cisco		
0512010602	Walnut Creek-Tippecanoe River	ETR	source water	
0512010603	Trimble Creek-Tippecanoe River	ETR		
0512010604	Chippewanuck Creek-Tippecanoe River	ETR		
0512010605	Eddy Creek-Tippecanoe River	ETR		
0512010606	Bruce Lake Outlet-Tippecanoe River	ETR		
0512010607	Mill Creek	ETR		
0512010608	Indian Creek	ETR		
0512010609	Dickey Creek-Tippecanoe River	ETR		
0512010612	Honey Creek-Tippecanoe River	ETR		
0512010613	Tippecanoe River	ETR		
0512010701	Kokomo creek - wildcat creek	source water		
0512010703	South Fork Wildcat Creek	ETR	exceptional use	Cat 1
0512010704	Wildcat Creek	ETR	exceptional use	
0512010802	Burnett Creek-Wabash River	ETR		
0512010804	Big Pine Creek	ETR	exceptional use	
0512010805	Kickapoo Creek-Wabash River	ETR		
0512010907	Jordan Creek-Middle Branch	ETR		
0512010908	North Fork Vermilion River	ETR		
0512011001	Browns Wonder Creek-Sugar Creek	ETR		
0512011004	Prarie Creek-Sugar Creek	ETR		
0512011302	River Deshee-Wabash River	ETR		
0512011303	Coffee Bayou-Wabash River	ETR		
0512011306	French Creek-Wabash River	ETR		
0512011307	Big Creek	ETR		

HUC 10	Watershed Name	Protected for (1)	Protected for (2)	Protected for (3)
0512011308	Fox River-Wabash River	ETR		
0512011309	Levy Slough-Wabash River	ETR		
0512011006	Sugar Creek	exceptional use		
0512010806	Big Shawnee Creek - Wabash river	exceptional use		

Table 18. Watersheds targeted for protection in the Wabash River and Tributaries drainage.

HUC 10	Watershed Name	Protected for
0712000103	Headwaters Yellow River	ETR
0712000105	Yellow River	ETR
0712000201	Oliver Ditch	ETR
0712000203	Bruner Ditch-Iroquois River	ETR
0712000207	Sugar Creek	ETR
0712000104	Mill Creek - Kankakee River	ETR
0712000110	Crooked Creek - Kankakee River	source water

Table 19. Watersheds targeted for protection in the Kankakee River drainage.

HUC 10	Watershed Name	Protected for (1)	Protected for (2)	Protected for (3)
0508000301	Martindale Creek - Whitewater River	ETR		
0508000302	Greens Fork Creek	ETR		
0508000304	Williams Creek - Whitewater River	ETR		
0508000305	Salt Creek	ETR	cat 1	source water
0508000306	Pipe Creek - Whitewater River	ETR		
0508000307	East Fork Whitewater	ETR	source water	
0508000308	Whitewater River	ETR		

Table 20. Watersheds targeted for protection in the Whitewater River drainage.

HUC 10	Watershed Name	Protected for (1)	Protected for (2)
512020901	Patoka Lake - Patoka River	source water	
512020903	Hunley Creek	source water	
512020904	Altar Cr - Patoka River	Cat 1	source water
512020906	Stone Coe - Patoka River	source water	
512020907	S F Patoka River	source water	

Table 21.Watersheds targeted for protection in the Patoka River drainage.

Programmatic Objectives

- Encourage watershed planning activities in watersheds with Category 1 waters (including those waters identified in Table 14 and in subsequent Integrated Reports). (FFY 2015-2018)
- Identify and prioritize for planning watersheds with source water intakes. (FFY2015-2018)
- Participate as requested in Phase II wellhead protection planning. (FFY 2013-2018)
- Develop priorities for plans and implementation in watersheds that impact Outstanding State Resource Waters and waters important for aquatic habitat. (FFY 2015-2018)
- Work with EPA to identify alternative plans such as TMDLs, Source Water Assessment Plans (SWAPs), etc. (FFY 2014-2017)

Financial

- Fund 319-eligible protection strategies identified in critical areas of IDEM-approved watershed management plans. (FFY 2015-2018)
- Use Section 319 when appropriate to fund alternate plans, such as TMDLs, SWAPs, etc., identified in cooperation with U.S.EPA. (FFY 2016-2018)

Technical

- Work with IDEM's Ground Water section and watershed groups, as well as CWSRF and Drinking Water SRF, to identify wells that need to be properly closed. (FFY 2015-2018)

Funding Mechanisms

Currently, Indiana uses a wide range of funding mechanisms to prevent and reduce nonpoint source (NPS) pollutants. To the extent that these resources remain available for NPS work, Indiana will continue to utilize them.

Clean Water Act grants
Indiana utilizes 319, 205(j), 212 (State Revolving Funds), and 106 (regular and supplemental) to perform NPS activities. The majority of 319(h) funds are passed through to fund local projects, while the remainder funds program staff at the state level. In the recent past, IDEM has utilized 205(j) funds received to fund the development of nutrient criteria, conduct monitoring at the outlet of the Wabash River to support the development of the Ohio River TMDL (in partnership with ORSANCO), and to write watershed management plans (WMPs) at the local level. The 106 funds granted to IDEM largely underwrite the monitoring programs described elsewhere in this document, as well as Assessment and TMDL program staff.

Section 319 requires states to match the federal 319 funding provided at a federal to state ratio of 60:40. Indiana currently uses dollars recycled through the Clean Water State Revolving Fund (CWSRF) loans, or local funds used for these projects, to match its administrative and technical support (programmatic) funding. It is anticipated that this arrangement will continue. Local project match (40% of the total project cost) is provided by project sponsors. At no time is federal money used to match federal grants.

State-led Programs: T by 2000, Lake and River Enhancement, Clean Water Indiana, and the Healthy Rivers INitiative
Historically, Indiana has used appropriations generated from the state cigarette tax as dedicated funding to support local Soil and Water Conservation Districts (SWCDs) and water quality improvement projects. State dedicated funding was recommended by the Governor's Soil Resources Study Commission in 1985. The Commission was charged with assessing the state of soil erosion in Indiana and to develop recommendations to address concerns that arose from the study. The state legislature established "T by 2000" funds to create the Division of Soil Conservation in the Indiana Department of Natural Resources (IDNR).

The Lake and River Enhancement (LARE) program began in 1987 when the funding for T by 2000 was first appropriated, with the goal to protect lakes from excessive sedimentation from upstream sources. Rivers were added to the eligible waters to receive funding in 1991. Initially, LARE funds constituted 10% of the T by 2000 program, about $300,000 at that time. The source of funding was changed to a lake and river enhancement fee paid through boat owners' annual registration through the Bureau of Motor Vehicles.

Erosion and sedimentation problems have persisted beyond the year 2000. The T by 2000 program was renamed Clean Water Indiana (CWI) and continues today. In 2005, the IDNR Division of Soil Conservation, and related CWI funding, was transitioned to the newly-created State Department of Agriculture (ISDA). During this transition, the LARE program remained in the IDNR, under the Division of Fish and Wildlife and became 100% funded through the lake and river enhancement fee annually paid by boat owners. Though funding amounts fluctuate,

approximately $1.8 million is annually available for LARE projects. In 2011, the General Assembly added logjam removal to the list of available projects to be funded through LARE.

The CWI program is codified at IC 14-32-8 and is administered by the ISDA as directed by the State Soil Conservation Board. The purpose of the fund is to "provide financial assistance to soil and water conservation districts, land occupiers, and conservation groups to implement conservation practices to reduce nonpoint sources of water pollution through education, technical assistance, training, and cost sharing programs" (P.L. 160-1999, amended by P.L.175-2006, SEC.18). CWI is currently funded through 1/6th of the cigarette tax fund, which is dwindling due to state and federal no-smoking educational campaigns. In the 118th First Session of General Assembly of the State of Indiana, conservation organizations such as the Indiana Association of Soil and Water Conservation Districts (IASWCD) encouraged lawmakers to appropriate more money to and to consider a different dedicated funding source for the CWI fund.

The Healthy Rivers INitiative is a relatively young state program. Begun in 2010, it is a land conservation program to protect floodplains in the Wabash River, Sugar Creek, and the Muscatatuck River. Though not a "traditional" funding source, this initiative is working with willing landowners to protect over 43,000 acres of vulnerable floodplain while creating floodwater storage and increasing public awareness of recreational and water quality issues.

Coastal Zone Act Reauthorization Amendments (CZARA)
Indiana utilizes funding received through the National Oceanic and Atmospheric Administration (NOAA) Office of Ocean and Coastal Resource Management program to fund:

- Protection and restoration of significant natural and cultural resources.
- Programs to prevent the loss of life and property in coastal hazard areas.
- Improved public access for recreational purposes.
- Revitalized urban waterfronts and ports.
- Improved coordination among government agencies in policy and decision-making processes.
- Pollution prevention initiatives, including non-point source pollution into coastal waters.

USDA Programs
The United States Department of Agriculture (USDA) provides grant and cost-share funding for conservation measures through the Natural Resources Conservation Service (NRCS) and the Farm Service Agency (FSA). These programs are subject to change with subsequent Farm Bills, but as of the writing of this document, the following USDA programs are in place:

<u>Conservation Reserve (Enhancement) Program</u>
FSA administers the Conservation Reserve Program (CRP) and the Conservation Reserve Enhancement Program (CREP). These are voluntary land retirement programs that allow producers to take environmentally-sensitive lands (e.g. highly erodible lands, riparian lands) out of production and plant them to some type of conservation cover for an environmental benefit. The FSA pays the producer an annual rental payment to off-set the cost of maintaining the land. CRP contracts are available for 10-15 year terms. Popular CRP practices in Indiana include filter strips (CP21), grassed waterways (CP8A), and native grass plantings (CP2).

The Conservation Reserve Enhancement Program (CREP) was described in the Program Successes section. CREP is a federal-state partnership that adds an additional appropriation to the state for certain CRP conservation practices (Table 22) and provides a one-time incentive payment from the state. In Indiana, CREP is available to 65 counties across eleven HUC-8 watersheds. The ISDA has technical assistance available to producers in the CREP watersheds to supplement federal agency support for the program.

Practice Code	Name	Environmental Benefit
CP2	Native Grasses	Remove sediment & nutrients, wildlife
CP3A	Hardwood Tree Planting	Wildlife, erosion control, reduced pollution from water, air and land, buffers waterways
CP4D	Wildlife Habitat	Wildlife, nutrient & sediment removal, recreation
CP21	Filter Strip	Wildlife, pollutant removal
CP22	Riparian Buffers	Stream shading, wildlife, pollution removal
CP23, CP23A	Wetland Restoration	Wildlife, nutrient & sediment removal
CP31	Bottomland Timber	Erosion control, wildlife, carbon sequester, pollution removal

Table 22. Indiana Eligible CREP Practices

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is a voluntary cost-sharing program, administered by NRCS, intended to provide assistance to producers in installing conservation practices to address environmental concerns. EQIP is easily the most popular program for "working lands" (crop and livestock agriculture, silviculture) in Indiana. Many of the practices (Appendix I) provide a water quality benefit. Producers compete for EQIP funds by applying for funds during a set period. Applications in each county are ranked according to local, state, and federal priorities. The applications with the highest scores after ranking are prioritized for funding. In FFY 2013, $26 million was made available to Indiana's producers through the general EQIP sign-up.

In addition to the regular appropriation to EQIP, several additional programs are funded through set-aside state or federal EQIP funds. These include the National Water Quality Initiative (NWQI), the Mississippi River Basin Initiative (MRBI), the Great Lakes Restoration Initiative (GLRI), and the Agricultural Water Enhancement Program (AWEP).

National Water Quality Initiative

The NWQI is a joint initiative between the NRCS and the U.S. Environmental Protection Agency (U.S. EPA), whereby 5% of state EQIP funds are set aside to address high-priority water quality concerns in watersheds with a nutrient or sediment impairment. The funding is to be allocated through landowner contracts for land in one to three 12-digit watersheds that have been chosen by NRCS and the water quality agency (IDEM) to be a part of the initiative. In Indiana, three watersheds were chosen: Silver Creek (HUC 051201040501), Ell Creek (051202090405), and Eagle Creek (051202011108). These watersheds were targeted for the additional EQIP dollars in FFY 2012 and 2013. While it remains to be seen whether or not the NWQI will continue to be offered in these watersheds for the duration of this plan, IDEM will coordinate with NRCS as long as this Initiative is implemented.

Agricultural Water Enhancement Program

The Agricultural Water Enhancement Program (AWEP) is a voluntary cost-sharing program that improves water quality or conserves surface or ground water on agricultural land. Unlike many of the Farm Bill programs, eligible program *partners* submit an application for their area of interest to NRCS. If the application is approved, additional EQIP monies will be made available for landowners in the area covered by the application; individual producers will have access to these dollars through a traditional EQIP contract with NRCS. In Indiana, two areas have been approved for AWEP funding: the St. Joseph River (MI) watershed (HUC 04050001) and LaPorte County.

Conservation Innovation Grants (CIG)

Under CIG, the NRCS can award grants to partners with innovative projects to address natural resource concerns, particularly using technology transfer. The funding and authority for this program are provided under EQIP and program eligibility must be met by landowners who will benefit from the proposed CIG project.

Wetland Reserve (Enhancement) Program

The Wetland Reserve Program (WRP) is the NRCS's wetland easement program. Under this program, historically-farmed wetlands can be returned to native wetland vegetation and hydrology. The program is voluntary and can provide restoration funds with or without an easement. Easements can be for 30 years or permanent. In addition, wetlands that were previously restored under a local, state or federal program can be placed into long-term protection.

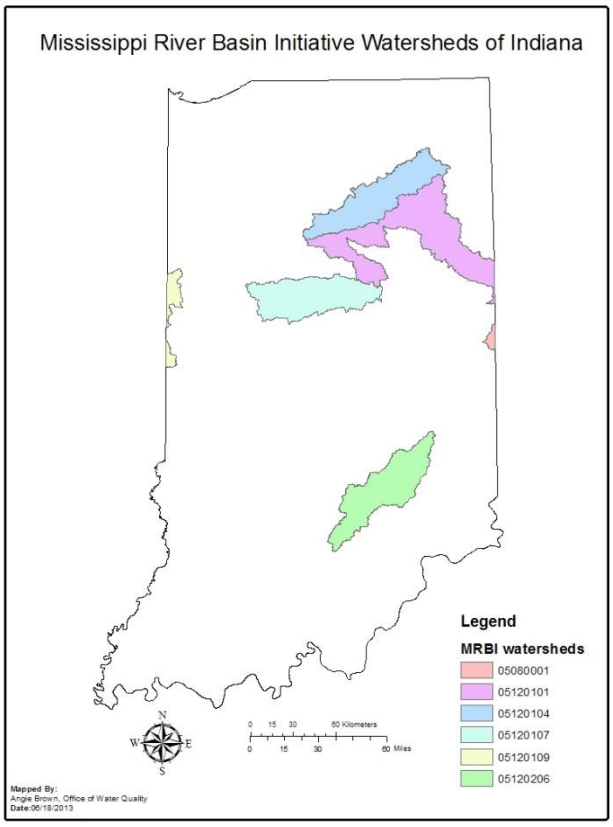

Figure 14. Indiana watersheds eligible for Mississippi River Basin Initiative (MRBI) funds.

The Wetland Reserve Enhancement Program (WREP) is one component of the Wetland Reserve Program. Leveraging resources from partners, NRCS enrolls lands into the easement program for protection and restoration. Indiana NRCS has partnered with The Nature Conservancy on two WREP projects – one in southwest Indiana and one in the Upper Wabash watershed.

Mississippi River Basin Initiative

MRBI is a regional competitive program administered under NRCS, funded through the Cooperative Conservation Partnership Initiative (CCPI), EQIP, CIG, Wildlife Habitat Incentive program (WHIP), CSP, and WREP programs. NRCS has identified 6 priority 8-digit watersheds in Indiana capable of competing for funding under the Initiative (Figure 14). As of 2013, Indiana had five MRBI projects.

Great Lakes Restoration Initiative (EQIP, WHIP, FRPP, EWPP –Floodplain Easements)

NRCS programs are one source of GLRI funding available to watersheds that drain to the Great

Lakes. 60,000 acres of privately-owned lands have been put into conservation through NRCS GLRI funding.

Western Lake Erie Basin Initiative (EQIP)
The Western Lake Erie Basin (WLEB) Initiative was put in place to address agricultural nutrient and sediment inputs into Lake Erie. The project area includes 820,770 acres in the St. Joseph River (OH), St. Marys River, Upper Maumee River, and Auglaize River watersheds in Indiana. Nineteen best management practices are eligible under this program.

Cooperative Conservation Partnership Initiative (EQIP, WHIP, CSP)
The Cooperative Conservation Partnership Initiative (CCPI) is a joint project initiative between NRCS and approved program partners. Under the CCPI, the NRCS has authority to make EQIP, WHIP, and/or Conservation Stewardship Program (CSP) resources available within an approved CCPI project area. Indiana currently has 4 CCPI projects, including Hoosier National Forest and statewide forestry projects; southwest Indiana irrigation project; and Wildcat Creek Invasives project.

Private and other Grants
While the majority of funding for NPS projects is provided through the programs described above, partners will occasionally use private funders and other state and federal grants to accomplish their NPS goals.

Indicators of Success

From an economics point of view, nonpoint source pollution (NPS) has been characterized as a "wicked problem" – a problem that is not solved, as much as it is either improved, made worse, or remains constant (Doering 2013). Wicked problems are not easily described, due to differing perspectives of the observers and the complex nature of the problem itself; and involve a great deal of uncertainty, complexity, and conflict. Under these conditions, wicked problems are not a typical "scientific problem," in which the problem is observed, defined, analyzed, and solved in a series of steps. Rather, the problems are somewhat defined by the solutions. Suggested methods for tackling wicked problems include authoritative strategies where a small number of people are made responsible for the larger problem; competitive strategies where the most opposing viewpoints are made responsible for choosing their most preferred solution, thereby generating many possible "best solutions" from which to choose; and collaborative strategies that include as many perspectives as possible to share knowledge and generate a consensus on an approach to tackle the problem (Roberts 2000).

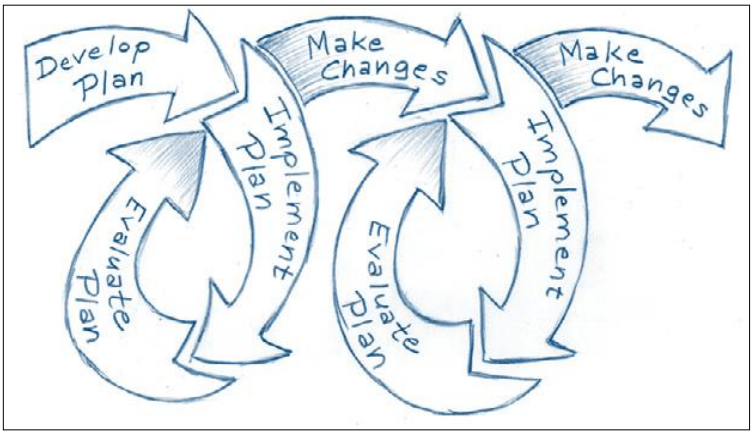

Figure 15. Adaptive management. (From EPA 2008)

Indiana's NPS program has chosen to work on the wicked problem of NPS under a collaborative process. The approach includes an iterative process of planning, implementing, evaluating, and adaptive management.

The indicators the Indiana Department of Environmental Management (IDEM) uses to evaluate its program will have an impact on the definition of "success" and in turn, will influence decisions that are made. Acknowledging this truth, IDEM has identified means of measuring program success based on both environmental and administrative measures.

Environmental Indicators

U.S. EPA's Strategic Measures: Measure WQ-SP10.N11 and WQ-SP12.N11

U.S. EPA, in its Strategic Plan 2011-2015, has set a national goal of attaining water quality standards for all pollutants and impairments in more than 3,360 water bodies identified in 2002 as not attaining standards (designated as Management Measure WQ-SP12.N11 or SP12). Additionally, by 2015, the U.S. EPA has a national goal to improve water quality conditions in 330 impaired watersheds nationwide using the watershed approach (designated as Management Measure WQ-SP10.N11 or WQ-10). On a regional scale, U.S. EPA has asked Indiana to show improvement in or delisting of five waterbodies that have appeared on the 2002 or subsequent Indiana 303(d) List of Impaired Waters to satisfy the WQ-10 commitment. Additionally, IDEM is to report on five 12-digit watersheds whose water quality conditions have improved (to satisfy the SP12 commitment).

The baseline approach for indicating success is complicated for Indiana. Though IDEM does list the common NPS pollutant *E. coli* on its 303(d) list and can report on its improvement, IDEM generally does not list for other common NPS pollutants such as nutrients or sediment, as Indiana does not have numerical water quality standards for those. Instead IDEM's Impaired Biotic Communities (IBC) is an indicator that there are water quality problems in the watershed – elevated nutrients that cause algal blooms and deplete oxygen is making life difficult for aquatic organisms in the waterbody or elevated sediment is creating poor habitat for fish and macroinvertebrates. Water quality improvements generally take a long time to manifest. IDEM's approach thus far has been to monitor those waters that are 1) listed on Indiana's 2002 303(d) List of Impaired Waters for *E. coli* and/or IBC; and 2) that have utilized 319 funding or a "watershed approach" to delist or show a trend of improvement. In accordance with the 2011-2019 Water Quality Monitoring Strategy, IDEM will continue to use additional resources (e.g. staff, funds, and technical support) to monitor water quality in select watersheds where NPS restoration activities have occurred. The monitoring data will be compared to baseline information, if available, to gauge the efficacy of the work. IDEM will also, to the extent practicable, continue to participate in the discussion of the appropriate baseline indicators to report to Congress and U.S. taxpayers the improvements being made through the use of Section 319 and related funds.

Estimated Load Reductions

Many of the NPS-related listings on the Indiana 303(d) List of Impaired Waters are due to elevated sediment, nutrients, and bacteria. IDEM will track, in the federal Grant Reporting and Tracking System (GRTS) database, estimated load reductions of these sediment and nutrients that are reported to the NPS program. At this time, IDEM does not have a means by which to track bacterial load reductions, though when it is able to do so, those reductions will be tracked as well. While the NPS program can only track those reductions that have been reported (most of which are BMPs funded and reported by 319 grantees), IDEM believes that reductions in these parameters indicate future improvements in water quality, as sources/causes of pollution are removed from the system.

Program Progress - Administrative Indicators

Additional indicators of success will be administrative in nature and demonstrate the success of the Nonpoint Source Program in meeting the goals of this plan. Some of these indicators include:

- Percentage of state covered by WMPs
- Money passed through to local entities for planning and implementation
- Number of watershed groups serviced through the program, grant-wise or through contact with watershed specialists
- Implementation of the External Data Framework and the submission of water quality data for potential use in making water quality assessments and determining nonpoint sources of pollution.

Action Register

The U.S. EPA guidance *Key Components of an Effective State Nonpoint Source Management Program* requires states to identify annual milestones against which the Nonpoint Source program will be evaluated. The previous goals and indicators section provided a narrative accounting of the strategies Indiana will use to control and mitigate nonpoint source pollution. The following action register provides a consolidated listing of the goals, objectives, and management measures described above, as well as identifying annual milestones as required by USEPA.

Goal 1	Utilize partnerships to leverage resources available for NPS management.		Responsible Party	Funding Source	Subcontractor/ Sponsor	FFY Starting	FFY Ending	Product
	A. Programmatic Objectives							
	1. Assist Indiana Department of Natural Resources, Lake Michigan Coastal Program to obtain full program approval		IDEM/DNR	319	In-house	2013	2018	Coastal Nonpoint Control Program and 15/5 Plan
	2. Work with Indiana Department of Natural Resources, Lake Michigan Coastal Program to complete the Deep River TMDL and WMP		IDEM/DNR	319	NIRPC	2013	2015	TMDL and WMP
	3. Work with Indiana Department of Natural Resources, Lake Michigan Coastal Program to restore and protect WQ in critical areas of coastal WMPs							
	MM1	Trail Creek	IDEM/DNR	319	LaPorte Co SWCD	2013	2014	BMPs; load reductions
	MM2	Deep River	IDEM/DNR	106, 319	NIRPC	2013	2017	WMP/TMDL
	MM3	Salt Creek	IDEM/DNR	319/CZM	TBD	TBD	TBD	BMPs; load reductions
	4. Support the Conservation Reserve Enhancement Program (CREP), Mississippi River Basin Initiative (MRBI), Great Lakes Restoration Initiative (GLRI), Lake and River Enhancement (LARE), Clean Water Indiana (CWI), and other Indiana Conservation Partnership (ICP) and statewide initiatives as they become available							
	MM1	By promoting the programs through the watershed specialists (WSS) and including them in relevant TMDLs as methods for implementation	IDEM	319, ISDA, FSA, NRCS	In-house	2013	2018	BMPs; load reductions
	MM2	By funding ISDA technicians to design and implement BMPs in select watersheds	IDEM/ISDA		ISDA	2013	2015	
	5. Work with ICP as an advisory group of state and federal agencies, as well as interested entities and organizations, to assist with refining the state's NPS policies and procedures.		IDEM	319	In-house	2013	2018	N/A
	6. Continue to provide technical assistance to local watershed groups through the WSS or project manager		IDEM	319	In-house	2013	2018	WMPs, BMPs, load reductions
	7. Utilize the TMDL-WMP template for 2014 TMDLs and beyond		IDEM – NPS	106		2014	2018	TMDL reports
	8. Continue to partner with the IN-USDA-NRCS on the National Water Quality Initiative (NWQI) for as long as the Initiative remains a national priority.		IDEM/NRCS	319/EQIP		2013	2018	BMPs, monitoring data
	9. Support implementation of the State Nutrient Reduction Strategy once approved		IDEM/ISDA	TBD	ICP	2014	2018	BMPs, load reductions
	B. Financial Objectives							
	1. Dedicate $100,000 to the Little Calumet-Galien watershed, HUC 04040001, annually until all of the remaining LMCP conditions are met		IDEM	319	In-house	2013	Until full approval occurs	WMPs, BMPs, CZMP
	2. Coordinate with CWSRF to link loan applicants and local watershed groups		IDEM	N/A	In-house	2014	2018	N/A
	C. Technical Objectives							
	1. Work with partners to model, assess, and prioritize critical watersheds in the state		IDEM/NRCS	319/ partner funds	ICP	2015	2018	List of priority watersheds
	2. Continue to provide technical assistance to local watershed groups through the Watershed Specialist or project manager		IDEM	319	In-house	On-going	On-going	WMP, load reductions

Goal 2	Monitor and assess Indiana waters for NPS impairments and improvements		Responsible Party	Funding Source	Subcontractor/ Sponsor	FFY Starting	FFY Ending	Product
	A. Programmatic Objectives							
	1. Require the use of the Environmental Monitoring for Watershed Groups handbook for 319 grantees		IDEM	319	Grantees	Annually	Annually	Data
	2. Coordinate with NRCS to develop a sampling regime for NWQI projects		IDEM/NRCS	319	In-house	2013	2015	Sampling plan
	3. Continue to implement the import of 319 grantee data into NPS-AIMS		IDEM	319	In-house/enfoTech	Ongoing	Ongoing	Data
	4. Invite the participation of local project leaders when conducting 305(b) CWA assessments on baseline monitoring data.		IDEM	106, 319	In-house	Ongoing	Ongoing	Baseline assessments
	Long-term goal: Revisit the way in which we characterize the sources and magnitude of NPS-impaired waters - revisit statewide land use, water quality data, assessments and modeling, as well as what partners and local groups are finding as to what is critical, to update the original 1989 assessment and perhaps refine the sources & magnitude of NPS in the state.							
	B. Financial Objectives							
	1. Continue to fund the Clean Lakes Program (volunteer and professional) data collection for use in Clean Water Act 305(b) and 303(d) listing		IDEM	319	IU	2013	2018	Data
	2. Direct IDEM resources to perform baseline characterization monitoring of at least one watershed annually to support TMDL and watershed planning efforts							
	MM1	Deep River TMDL and WMP	IDEM	319, 106	IDEM TMDL/NIRPC	2013	2017	Data, assessments, TMDL, WMP
	MM2	Lower Whitewater TMDL and WMP	IDEM	319, 106	IDEM TMDL/Dearborn Co SWCD	2014	2018	Data, assessments, TMDL, WMP
	3. Utilize Section 319 funding to monitor waterbodies identified as targets of the National Water Quality Monitoring Initiative (NWQI)		IDEM/NRCS	319	TBD	2015	2018	Data
	C. Technical Objectives							
	1. Integrate Hoosier Riverwatch voluntary monitoring program into the work of the Nonpoint Source program							
	MM1	QAPP completed	IDEM	319	In-house	2013	2014	QAPP
	MM2	Provide support for 20 Hoosier Riverwatch workshops (volunteer trainings) and maintain current loaner/teaching trunks	IDEM	319	HR Coordinator & Volunteer Trainers	2013	2018	Trained volunteers, HR manuals
	MM3	Provide support for maintenance of the Hoosier Riverwatch water quality monitoring database and associated websites.	IDEM	319	Contractor (TBD)	2013	2018	HR website and database
	2. Complete the following components of the External Data Framework							
	MM1	Complete acceptance criteria for External Data Framework	IDEM	106	In-house	2014	2016	Acceptance criteria
	MM2	Complete technical assistance and outreach for EDF	IDEM	Supp 106	D.J. Case	2013	2015	Webpages
	MM3	Begin accepting, reviewing and ranking water quality data provided by external organizations and, if appropriate, using the data to make 305(b)/303(d) water quality assessment and listing decisions.	IDEM	106	In-house	2018	Ongoing	More robust data set for the IR
	3. Use additional resources (e.g., staff, funds, and technical support) to monitor water quality in watersheds where NPS restoration activities have occurred. The monitoring data will be compared to baseline information, if available, to gauge the efficacy of the work.							
	MM1	Upper Tippecanoe	IDEM	319, 106	In-house	2013	2013	Success Story
	MM2	Blue River	IDEM	319, 106	In-house	2013	2013	Measure W
	MM3	Deep River follow-up monitoring	IDEM	319, 106	In-house	2018	2019	Measure W/Success Story
	4. Utilize probabilistic monitoring, along with some targeted monitoring, to determine water quality improvements in the coastal zone		IDEM	319, 106	In-house/LMCP input	2018	2020	Data
	5. Evaluate water quality data to identify watersheds that should be surveyed for possible NPS water quality improvements.		IDEM	319, 106	In-house	Ongoing	Ongoing	Data
	6. Continue the Ground water Monitoring Network (GWMN)		IDEM	106	Ground water Section	2013	2018	Raw data/reports
	Long-term goal: Analyze the findings of all ground water data taken by the state to characterize the causes, sources, and magnitude of NPS in ground water		IDEM	106	Ground water Section	TBD	TBD	Reports

Goal 3	Develop and conduct a strategic outreach and education program.		Responsible Party	Funding Source	Subcontractor/ Sponsor	FFY Starting	FFY Ending	Product
	A. Programmatic Objectives							
	1. Highlight successes of the program, including successful grantees and other partners							
	MM1	Produce 5 "Success Stories" (EPA WQ-10 Strategic Measure) by 2018 and publicize widely within Indiana	IDEM/ICP	319/Partner funds	In-house	2013	2018	Success Stories
	MM2	Publicize any awards given to watershed groups related to their water quality efforts in Indiana	IDEM	319	In-house	2013	2018	N/A
	2. Continue to provide citizen monitoring training through Hoosier Riverwatch and the Clean Lakes Program		IDEM	319	In-house/IU	2013	2018	Data/assessments
	3. Annually review print materials for updates and reprint as needed		IDEM	319	In-house	2013	2018	Updated materials
	4. Outreach in the Lake Michigan Coastal Zone							
	MM1	Market on-site disposal system inspections at property transfer to lending institutions in Coastal Zone	DNR-LMCP	CZM	DNR	2013	2018	Ordinance?
	MM2	Work with partners to develop Septic Awareness Campaign regarding septic impacts. Items may include developing Public Service Announcements regarding the importance of proper on-site disposal system maintenance	DNR-LMCP	CZM	DNR	2013	2018	Awareness campaign
	MM3	Promote the use of the Revolving Loan Fund for Septic upgrades and repairs	DNR-LMCP	CZM	DNR	2013	2018	Promotional materials
	5. Provide cost-effective outreach to audiences in Indiana							
	MM1	Utilize social media to provide up-to-the minute information to followers of IDEM's social media outlets	IDEM	319/PPG	In-house	Ongoing	Ongoing	Tweets, posts, etc
	MM2	Work with other ICP organizations to strategize about outreach to absentee landowners	IDEM/ICP	319/Partner funds	In-house	2015	2018	TBD
	MM3	Continue to participate in the Pathway to Water Quality at the Indiana State Fairgrounds	IDEM/ICP	319/Partner funds	IASWCD	Ongoing	Ongoing	Facetime/contacts made
	6. Continue outreach to the community of County Surveyors to become involved in water quality improvement through the IWLA, the Indiana Association of County Surveyors, local watershed groups, and county contacts		IDEM - WSS	319	In-house	Ongoing	Ongoing	N/A
	Long-term goal: Work with partners to develop a statewide NPS marketing campaign including widely disseminated materials such as statewide commercials/billboards							
	MM1	Work with partners to define the purpose of the outreach program	IDEM/Partners	319/Partner funds	In-house	2014	2018	Purpose
	MM2	Work with partners to identify the target audience	IDEM/Partners	319/Partner funds	In-house	2014	2018	Audience identified
	MM3	Work with partners to develop a consistent statewide message	IDEM/Partners	319/Partner funds	In-house	2014-2015	2018	Message
	MM4	Publicize success stories through multiple media applications	IDEM/Partners	319/Partner funds	In-house	Annually	Annually	Releases
	MM5	Support technical events to exchange information between government partners, watershed groups, and citizens	IDEM/Partners	319/Partner funds	In-house	Annually	Annually	Events
	B. Financial Objectives							
	Long-term goal: use 319 funds to leverage for partner-based statewide marketing campaign including widely disseminated materials such as statewide television/radio commercials/billboards							
	C. Technical Objectives							
	1. Continue to build capacity for water quality improvement in the state							

Goal 3	Develop and conduct a strategic outreach and education program.		Responsible Party	Funding Source	Subcontractor/ Sponsor	FFY Starting	FFY Ending	Product
	MM1	Continue to provide technical assistance to Purdue University's Indiana Watershed Leadership Academy	IDEM	319	In-house	2013	2018	Watershed leaders trained
	MM2	Continue to support the ICP's Training and Certification Program on watershed related issues by sitting on the Technical Research Board and the advisory team	IDEM	Partner funds	In-house	2013	2018	N/A
	2. Work with U.S. EPA to identify non-9-Elements Plans (such as TMDLs, SWATs, etc.) that can be implemented using 319 funds and pursue outreach goals identified therein		IDEM/EPA	319	In-house	2014	Ongoing	Plans identified

Goal 4	**Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions.**		**Responsible Party**	**Funding Source**	**Subcontractor/ Sponsor**	**FFY Starting**	**FFY Ending**	**Product**
	A. Programmatic Objectives							
	1. Capitalize on the monitoring and load-calculations done during TMDL development to inform forthcoming watershed planning projects							
	MM1	Utilize TMDLs, when applicable, to jump-start planning projects	IDEM	319, 106	In-house	2013	2018	TMDLs
	MM2	Utilize the TMDL-WMP template for TMDLs sampled for and written in 2014 and beyond so that they are implementable using 319 funds	IDEM	106	In-house	Ongoing	ongoing	TMDL on template
	MM3	Prioritize TMDLs for the next five years to give watershed groups an idea of where TMDLs will be pursued	IDEM	106	In-house	2013	2014	TMDL priorities list
	MM4	Link TMDLs with baseline water monitoring projects for Section 319 watershed management planning applications	IDEM	106, 319	In-house/grantees	2013	Ongoing	TMDL
	2. Develop guidance for updating watershed management plans		IDEM	319	In-house	2014	2016	Guidance
	3. Promote integration of WMPs with local comprehensive plans		IDEM-WSS	319	In-house	2014	2018	N/A
	4. Identify alternative plans that could be implemented using 319 funds		IDEM	319	In-house	2014	2017	List of plans
	5. In conjunction with the TMDL program, pilot the Recovery Potential Tool in the Deep River, Patoka River, and Mississinewa River watersheds to prioritize TMDL/WMP activities in the state		IDEM	106, 319	In-house	2013	2015	Prioritized watersheds
	6. Provide SRF with Watershed Specialists as contacts for their applicants to pursue NPS projects as a part of their loans		IDEM	319	In-house	2014	2014	N/A
	7. Integrate disparate NPS program databases into one centralized integrated Watershed database to assist with tracking and reporting							
	MM1	Develop scope of work for the integrated databases project	IDEM	319	In-house	2014	2015	Scope of work
	MM2	Hire contractor to work on the project	IDEM	319	TBD	2015	2018	Contract
	B. Financial Objectives							
	1. Use Section 319 funding to support implementation of WMPs that meet the U.S. EPA'S 9 Key Elements of a Watershed Plan (includes staff support and outreach as well as BMPs)		IDEM	319	TBD	2013	2018	BMPs
	2. Repair previously-installed BMPs with the caveats outlined in the program policy		IDEM	319	TBD	2013	2018	BMPs
	3. Continue to leverage LARE and CWI funds to address erosion, sedimentation and nutrient input concerns as long as the General Assembly continues to approve appropriations.		IDEM/ICP	319/LARE/CWI	SWCDs, Lake associations	2013	2018	BMPs, education/outreach
	C. Technical Objectives							
	1. Develop guidance for the identification of critical areas		IDEM	319	In-house	2014	2014	Guidance
	2. Show partial or total restoration in at least 5 12-digit watersheds in the next 5 years.		IDEM	319	In-house	Ongoing	Ongoing	Success Story or Measure W
	3. Develop a way to track E. coli load reductions		IDEM	319	TBD	2014	2018	Model, equation, etc
	4. Geolocate all BMPs installed through the Section 319 grant program in order to enhance the BMP GIS layer located in the NPS program		IDEM	319	In-house	2014	Ongoing	GIS shapefile/ geodatabase
	5. Solicit for proposals to use Section 319 funding to support implementation of WMPs that meet the U.S. EPA'S 9 Key Elements of a Watershed Plan (includes staff support as well as BMPs)		IDEM	319	In-house	2013	2018	Solicitation
	MM1	Provide financial and technical support to install agricultural BMPs	IDEM/ICP	319	TBD	2013	2018	BMPs/ load reductions

Goal 4	Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions.		Responsible Party	Funding Source	Subcontractor/ Sponsor	FFY Starting	FFY Ending	Product
	MM2	Provide financial and technical support to install urban and/or residential BMPs	IDEM	319	TBD	2013	2018	BMPs/ load reductions
	MM3	Provide financial and technical support to install forestry BMPs	IDEM/IDNR – Forestry	319	TBD	2013	2018	BMPs/ load reductions
	MM4	Provide financial and technical support to install abandoned mine BMPs	IDEM/IDNR-DOR	319	TBD	2013	2018	BMPs/ load reductions
	MM5	Provide financial and technical support to install hydrological and aquatic habitat BMPs	IDEM/IDNR-LARE	319	TBD	2013	2018	BMPs/ load reductions

Goal 5	**Protect sensitive waters of the state so that they may continue to meet their designated uses.**	**Responsible Party**	**Funding Source**	**Subcontractor/ Sponsor**	**FFY Starting**	**FFY Ending**	**Product**
	A. Programmatic Objectives						
	1. Encourage watershed planning activities in watersheds with Category 1 waters (including those waters identified in Table 14 and in subsequent integrated reports)	IDEM	319	In-house	2015	2018	WMPs
	2. Identify and prioritize for planning watersheds with source water intakes	IDEM	319, 106	In-house	2015	2018	Prioritized list of watersheds
	3. Participate as requested in Phase II wellhead protection planning	IDEM	319	In-house	2013	2018	Updated WHPP
	4. Develop priorities for plans and implementation in watersheds that impact Outstanding State Resource Waters and waters important for aquatic habitat	IDEM	319	In-house	2015	2018	N/A
	5. Work with EPA to identify alternative plans such as TMDLs, Source Water Assessment Plans (SWAPs), etc, that can be implemented with 319 funds	IDEM	319	In-house	2014	2017	List of plans
	B. Financial Objectives						
	1. Fund protection strategies identified in critical areas of IDEM-approved watershed management plans	IDEM	319	In-house/grantees	2015	2018	BMPs
	2. Use Section 319 when appropriate to fund alternate plans, such as TMDLs, SWAPs, etc., identified in cooperation with U.S.EPA	IDEM	319	In-house	2016	2018	BMPs
	C. Technical Objectives						
	1. Work with IDEM's Ground Water section and watershed groups, as well as CWSRF and Drinking Water SRF, to identify wells that need to be properly closed	IDEM	319, 106, 212	GW/SRF	2015	2018	Wells properly closed

Adaptive Management

Adaptive management is a cornerstone of the Indiana Nonpoint Source (NPS) program. It drives change through the practical application of an open and honest program evaluation. As new tools are developed and inefficiencies are discovered, Indiana Department of Environmental Management (IDEM) adapts its administrative process accordingly. Examples of adaptive management that have taken place over the last five years are:

- Transitioned watershed specialist (WSS) positions to be a WSS/project managers
- Began baseline monitoring and targeted monitoring
- Became better integrated with partners at the state level
- Improved the 319 grant process by revising the application, review criteria, and BMP implementation guidance

IDEM NPS will evaluate its program annually and report on the status of the goals outlined in this plan. The NPS Annual Report will be made available to the public via the IDEM NPS website, http://www.watersheds.in.gov.

IDEM will work with U.S. Environmental Protection Agency (U.S. EPA) to correct any deficiencies that might become apparent in the program through the NPS Annual Report. Where annual milestones prove unachievable, IDEM will seek technical assistance from U.S. EPA to revise those milestones. As goals are completed, they can be moved from the Goals section to the Program Successes section. Though minor programmatic adjustments may be made on an ad hoc basis, IDEM NPS will prepare a thorough update of this plan in 2018.

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Appendix A

SEC. 319 [33 U.S.C. 1329] Nonpoint Source Management Programs

(a) State Assessment Reports.--

(1) Contents.--The Governor of each State shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval, a report which--

(A) identifies those navigable waters within the State which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards or the goals and requirements of this Act;

(B) identifies those categories and subcategories of nonpoint sources or, where appropriate, particular nonpoint sources which add significant pollution to each portion of the navigable waters identified under subparagraph (A) in amounts which contribute to such portion not meeting such water quality standards or such goals and requirements;

(C) describes the process, including intergovernmental coordination and public participation, for identifying best management practices and measures to control each category and subcategory of nonpoint sources and, where appropriate, particular non point sources identified under subparagraph (B) and to reduce, to the maximum extent practicable, the level of pollution resulting from such category, subcategory, or source; and

(D) identifies and describes State and local programs for controlling pollution added from nonpoint sources to, and improving the quality of, each such portion of the navigable waters, including but not limited to those programs which are receiving Federal assistance under subsections (h) and (i).

(2) Information Used in Preparation.--In developing the report required by this section, the State

(A) may rely upon information developed pursuant to sections 208, 303(e), 304(f), 305(b), and 314, and other information as appropriate, and

(B) may utilize appropriate elements of the waste treatment management plans developed pursuant to sections 208(b) and 303, to the extent such elements are consistent with and fulfill the requirements of this section.

(b) State Management Programs.--

(1) In General.--The Governor of each State, for that State or in combination with adjacent States, shall, after notice and opportunity for public comment, prepare and submit to the Administrator for approval a management program which such State proposes to implement in the first four fiscal years beginning after the date of submission of such management program for controlling pollution added from nonpoint sources to the navigable waters within the State and improving the quality of such waters.

(2) Specific Contents.--Each management program proposed for implementation under this subsection shall include each of the following:

(A) An identification of the best management practices and measures which will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular nonpoint source designated under paragraph (1)(B), taking into account the impact of the practice on ground water quality.

(B) An identification of programs (including, as appropriate, nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects) to achieve implementation of the best management practices by the categories, subcategories, and particular nonpoint sources designated under subparagraph (A).

(C) A schedule containing annual milestones for (i) utilization of the program implementation methods identified in subparagraph (B), and (ii) implementation of the best management practices identified in subparagraph (A) by the categories, subcategories, or particular nonpoint sources designated under paragraph (1)(B). Such schedule shall provide for utilization of the best management practices at the earliest practicable date.

(D) A certification of the attorney general of the State or States (or the chief attorney of any State water pollution control agency which has independent legal counsel) that the laws of the State or States, as the case may be, provide adequate authority to implement such management program or, if there is not such adequate authority, a list of such additional authorities as will be necessary to implement such management program. A schedule and commitment by the State or States to seek such additional authorities as expeditiously as practicable.

(E) Sources of Federal and other assistance and funding (other than assistance provided under subsections (h) and (i) which will be available in each of such fiscal years for supporting implementation of such practices and measures and the purposes for which such assistance will be used in each of such fiscal years.

(F) An identification of Federal financial assistance programs and Federal development projects for which the State will review individual assistance applications or development projects for their effect on water quality pursuant to the procedures set forth in Executive Order 12372 as in effect on September 17, 1983, to determine whether such assistance applications or development projects would be consistent with the program prepared under this subsection; for the purposes of this subparagraph, identification shall not be limited to the assistance programs or development projects subject to Executive Order 12372 but may include any programs listed in the most recent Catalog of Federal Domestic Assistance which may have an effect on the purposes and objectives of the State's nonpoint source pollution management program.

(3) Utilization of Local and Private Experts.--In development and implementing a management program under this subsection, a State shall, to the maximum extent practicable, involve local public and private agencies and organizations which have expertise in control of nonpoint sources of pollution.

(4) Development on Watershed Basis.--A State shall, to the maximum extent practicable, develop and implement a management program under this subsection on a watershed-by-watershed basis within such State.

(c) Administrative Provisions.--

(1) Cooperation Requirement.--Any report required by subsection (a) and any management program and report required by subsection (b) shall be developed in cooperation with local, substate regional, and interstate entities which are actively planning for the implementation of nonpoint source pollution controls and have either been certified by the Administrator in accordance with section 208, have worked jointly with the State on water quality management planning under section 205(j), or have been designated by the State legislative body or Governor as water quality management planning agencies for their geographic areas.

(2) Time Period for Submission of Reports and Management Programs.-- Each report and management program shall be submitted to the Administrator during the 18-month period beginning on the date of the enactment of this section.

(d) Approval or Disapproval of Reports and Management Programs.--

(1) Deadline.--Subject to paragraph (2), not later than 180 days after the date of submission to the Administrator of any report or management program under this section (other than subsections (h), (i), and (k)), the Administrator shall either approve or disapprove such report or management program, as the case may be. The Administrator may approve a portion of a management program under this subsection. If the Administrator does not disapprove a report, management program, or portion of a management program in such 180-day period, such report, management program, or portion shall be deemed approved for purposes of this section.

(2) Procedure for Disapproval.--If, after notice and opportunity for public comment and consultation with appropriate Federal and State agencies and other interested persons, the Administrator determines that--

(A) the proposed management program or any portion thereof does not meet the requirements of subsection (b)(2) of this section or is not likely to satisfy, in whole or in part, the goals and requirements of this Act;

(B) adequate authority does not exist, or adequate resources are not available, to implement such program or portion;

(C) the schedule for implementing such program or portion is not sufficiently expeditious; or

(D) the practices and measures proposed in such program or portion are not adequate to reduce the level of pollution in navigable waters in the State resulting from nonpoint sources and to improve the quality of navigable waters in the State; the Administrator shall within 6 months of the receipt of the proposed program notify the State of any revisions or modifications necessary to obtain approval. The State shall thereupon have an additional 3 months to submit its revised management program and the Administrator shall approve or disapprove such revised program within three months of receipt.

(3) Failure of State to Submit Report.--If a Governor of State does not submit the report required by subsection (a) within the period specified by subsection (c)(2), the Administrator shall, within 30 months after the date of the enactment of this section, prepare a report for such State which makes the identifications required by paragraphs (1)(A) and (1)(B) of subsection (a). Upon completion of the requirement of the preceding sentence and after notice and opportunity for comment, the Administrator shall report to Congress on his actions pursuant to this section.

(e) Local Management Programs; Technical Assistance.--If a State fails to submit a management program under subsection (b) or the Administrator does not approve such a management program, a local public agency or organization which has expertise in, and authority to, control water pollution, resulting from nonpoint sources in any area of such State which the Administrator determines is of sufficient geographic size may, with approval of such State, request the Administrator to provide, and the Administrator shall provide, technical assistance to such agency or organization in developing for such area a management program which is described in subsection (b) and can be approved pursuant to subsection (d). After development of such management program, such agency or organization shall submit such management program to the Administrator for approval. If the Administrator approves such management program, such agency or organization shall be eligible to receive financial assistance under subsection (h) for implementation of such management program as if such agency or organization were a State for which a report submitted under subsection (a) and a management program submitted under subsection (b) were approved under this section. Such financial assistance shall be subject to the same terms and conditions as assistance provided to a State under subsection (h).

(f) Technical Assistance for States.-- Upon request of a State, the Administrator may provide technical assistance to such State in developing a management program approved under subsection (b) for those portions of the navigable waters requested by such State.

(g) Interstate Management Conference.--

(1) Convening of Conference; Notification; Purpose.--If any portion of the navigable waters in any State which is implementing a management program approved under this section is not meeting applicable water quality standards or the goals and requirements of this Act as a result, in whole or in part, of pollution from nonpoint sources in another State, such State may petition the Administrator to convene, and the Administrator shall convene, a management conference of all States which contribute significant pollution resulting from nonpoint sources to such portion. If, on the basis of information available, the Administrator determines that a State is not meeting applicable water quality standards or the goals and requirements of this Act as a result, in whole or in part, of significant pollution from nonpoint sources in another State, the Administrator shall notify such States. The Administrator may convene a management conference under this paragraph not later than 180 days after giving such notification, whether or not the State which is not meeting such standards requests such conference. The purpose of such conference shall be to develop an agreement among such States to reduce the level of pollution in such portion resulting from nonpoint sources and to improve the water quality of such portion. Nothing in such agreement shall supersede or abrogate rights to quantities of water which have been established by interstate water compacts, Supreme Court decrees, or State water laws. This subsection shall not apply to any pollution which is subject to the Colorado River Basin Salinity Control Act. The

requirement that the Administrator convene a management conference shall not be subject to the provisions of section 505 of this Act.

(2) State Management Program Requirement.--To the extent that the States reach agreement through such conference, the management programs of the States which are parties to such agreements and which contribute significant pollution to the navigable waters or portions thereof not meeting applicable water quality standards or goals and requirements of this Act will be revised to reflect such agreement. Such a management programs shall be consistent with Federal and State law.

(h) Grant Program.--

(1) Grants for Implementation of Management Programs.--Upon application of a State for which a report submitted under subsection (a) and a management program submitted under subsection (b) is approved under this section, the Administrator shall make grants, subject to such terms and conditions as the Administrator considers appropriate, under this subsection to such State for the purpose of assisting the State in implementing such management program. Funds reserved pursuant to section 205(j)(5) of this Act may be used to develop and implement such management program.

(2) Applications.--An application for a grant under this subsection in any fiscal year shall be in such form and shall contain such other information as the Administrator may require, including an identification and description of the best management practices and measures which the State proposes to assist, encourage, or require in such year with the Federal assistance to be provided under the grant.

(3) Federal Share.--The Federal share of the cost of each management program implemented with Federal assistance under this subsection in any fiscal year shall not exceed 60 percent of the cost incurred by the State in implementing such management program and shall be made on condition that the non-Federal share is provided from non-Federal sources.

(4) Limitation on Grant Amounts.-- Notwithstanding any other provision of this subsection, not more than 15 percent of the amount appropriated to carry out this subsection may be used to make grants to any one State, including any grants to any local public agency or organization with authority to control pollution from nonpoint sources in any area of such State.

(5) Priority for Effective Mechanisms.--For each fiscal year beginning after September 30, 1987, the Administrator may give priority in making grants under this subsection, and shall give consideration in determining the Federal share of any such grant, to States which have implemented or are proposing to implement management programs which will--

(A) control particularly difficult or serious nonpoint source pollution problems, including, but not limited to, problems resulting from mining activities;

(B) implement innovative methods or practices for controlling nonpoint sources of pollution, including regulatory programs where the Administrator deems appropriate;

(C) control interstate nonpoint source pollution problems; or

(D) carry out ground water quality protection activities which the Administrator determines are part of a comprehensive nonpoint source pollution control program, including research, planning, ground water assessments, demonstration programs, enforcement, technical assistance, education, and training to protect ground water quality from nonpoint sources of pollution.

(6) Availability for Obligation.--The funds granted to each State pursuant to this subsection in a fiscal year shall remain available for obligation by such State for the fiscal year for which appropriated. The amount of any such funds not obligated by the end of such fiscal year shall be available to the Administrator for granting to other States under this subsection in the next fiscal year.

(7) Limitation on Use of Funds.-- States may use funds from grants made pursuant to this section for financial assistance to persons only to the extent that such assistance is related to the costs of demonstration projects.

(8) Satisfactory Progress.--No grant may be made under this subsection in any fiscal year to a State which in the preceding fiscal year received a grant under this subsection unless the Administrator determines that such State made satisfactory progress in such preceding fiscal year in meeting the schedule specified by such State under subsection (b)(2).

(9) Maintenance of Effort.--No grant may be made to a State under this subsection in any fiscal year unless such State enters into such agreements with the Administrator as the Administrator may require to ensure that such State will maintain its aggregate expenditures from all other sources for programs for controlling pollution added to the navigable waters in such State from non- point sources and improving the quality of such waters at or above the average level of such expenditures in its two fiscal years preceding the date of enactment of this subsection.

(10) Request for Information.--The Administrator may request such information, data, and reports as he considers necessary to make the determination of continuing eligibility for grants under this section.

(11) Reporting and Other Requirements.--Each State shall report to the Administrator on an annual basis concerning (A) its progress in meeting the schedule of milestones submitted pursuant to subsection (b)(2)(C) of this section, and (B) to the extent that appropriate information is available, reductions in nonpoint source pollutant loading and improvements in water quality for those navigable waters or watersheds within the State which were identified pursuant to subsection (a)(1)(A) of this section resulting from implementation of the management program.

(12) Limitation on Administrative Costs.--For purposes of this subsection, administrative costs in the form of salaries, overhead, or indirect costs for services provided and charged against activities and programs carried out with a grant under this subsection shall not exceed in any fiscal year 10 percent of the amount of the grant in such year, except that costs of implementing enforcement and regulatory activities, education, training, technical assistance, demonstration projects, and technology transfer programs shall not be subject to this limitation.

(i) Grants for Protecting Ground water Quality.--

(1) Eligible Applicants and Activities.--Upon application of a State for which a report submitted under subsection (a) and a plan submitted under subsection (b) is approved under this section, the Administrator shall make grants under this subsection to such State for the purpose of assisting such State in carrying out ground water quality protection activities which the Administrator determines will advance the State toward implementation of a comprehensive nonpoint source pollution control program. Such activities shall include, but not be limited to, research planning, ground water assessments, demonstration programs, enforcement, technical assistance, education and training to protect the quality of ground water and to prevent contamination of ground water from nonpoint sources of pollution.

(2) Applications.--An application for a grant under this subsection shall be in such form and shall contain such information as the Administrator may require.

(3) Federal Share; Maximum Amount.--The Federal share of the cost of assisting a State in carrying out ground water protection, activities in any fiscal year under this subsection shall be 50 percent of the costs incurred by the State in carrying out such activities, except that the maximum amount of Federal assistance which any State may receive under this subsection in any fiscal year shall not exceed $150,000.

(4) Report.--The Administrator shall include in each report transmitted under subsection (m) a report on the activities and programs implemented under this subsection during the preceding fiscal year.

(j) Authorization of Appropriations.-- There is authorized to be appropriated to carry out subsections (h) and (i) not to exceed $70,000,000 for fiscal year 1988, $100,000,000 per fiscal year for each of fiscal years 1989 and 1990, and $130,000,000 for fiscal year 1991; except that for each of such fiscal years not to exceed $7,500,000 may be made available to carry out subsection (i). Sums appropriated pursuant to this subsection shall remain available until expended.

(k) Consistency of Other Programs and Projects With Management Programs.-- The Administrator shall transmit to the Office of Management and Budget and the appropriate Federal departments and agencies a list of those assistance programs and development projects identified by each State under subsection (b)(2)(F) for which individual assistance applications and projects will be reviewed pursuant to the procedures set forth in Executive Order 12372 as in effect on September 17, 1983. Beginning not later than sixty days after receiving notification by the Administrator, each Federal department and agency shall modify existing regulations to allow States to review individual development projects and assistance applications under the identified Federal assistance programs and shall accommodate, according to the requirements and definitions of Executive Order 12372, as in effect on September 17, 1983, the concerns of the State regarding the consistency of such applications or projects with the State nonpoint source pollution management program.

(l) Collection of Information.--The Administrator shall collect and make available, through publications and other appropriate means, information pertaining to management practices and implementation methods, including, but not limited to, (1) information concerning the costs and relative efficiencies of best management practices for reducing nonpoint source pollution; and (2)

available data concerning the relationship between water quality and implementation of various management practices to control nonpoint sources of pollution.

(m) Reports of Administrator.--

(1) Annual Reports.--Not later than January 1, 1988, and each January 1 thereafter, the Administrator shall transmit to the Committee on Public Works and Transportation of the House of Representatives and the Committee on Environment and Public Works of the Senate, a report for the preceding fiscal year on the activities and programs implemented under this section and the progress made in reducing pollution in the navigable waters resulting from nonpoint sources and improving the quality of such waters.

(2) Final Report.--Not later than January 1, 1990, the Administrator shall transmit to Congress a final report on the activities carried out under this section. Such report, at a minimum, shall--

(A) describe the management programs being implemented by the States by types and amount of affected navigable waters, categories and subcategories of nonpoint sources, and types of best management practices being implemented;

(B) describe the experiences of the States in adhering to schedules and implementing best management practices;

(C) describe the amount and purpose of grants awarded pursuant to subsections (h) and (i) of this section;

(D) identify, to the extent that information is available, the progress made in reducing pollutant loads and improving water quality in the navigable waters;

(E) indicate what further actions need to be taken to attain and maintain in those navigable waters (i) applicable water quality standards, and (ii) the goals and requirements of this Act;

(F) include recommendations of the Administrator concerning future programs (including enforcement programs) for controlling pollution from nonpoint sources; and

(G) identify the activities and programs of departments, agencies, and instrumentalities of the United States which are inconsistent with the management programs submitted by the States and recommend modifications so that such activities and programs are consistent with and assist the States in implementation of such management programs.

(n) Set Aside for Administrative Personnel.--Not less than 5 percent of the funds appropriated pursuant to subsection (j) for any fiscal year shall be available to the Administrator to maintain personnel levels at the Environmental Protection Agency at levels which are adequate to carry out this section in such year.

[319 added by PL 100-4]

Appendix B

U.S. EPA Guidance for State 319 programs

Section 319 Program Guidance:
Key Components of an Effective State Nonpoint Source Management Program
November 2012

This guidance is an update of the nine key elements guidance contained in the U.S. Environmental Protection Agency's (EPA's) *1997 Guidance for Section 319(h) Grants (www.epa.gov/nps/npsguid1.html#IIIa),* and contains a description of the key components that characterize an effective state nonpoint source (NPS) management program. The original guidance was developed by EPA with input from state lead NPS control agencies. Similarly, during the spring of 2012, EPA convened an EPA-state workgroup to inform section 319 program improvements; this update was developed with input from this workgroup and further refined by comments and input from other states.

EPA expects all states to review and, as appropriate, revise and update their NPS management programs every five years. An updated, comprehensive program is critical to the states and EPA. It will allow EPA and the states to ensure that section 319 funding, technical support and other resources are directed in an effective and efficient manner to support state efforts to address water quality issues on a watershed basis. States should refer to these key components during review and update of their programs. States will then submit their updated programs to EPA for approval.

1. The state program contains explicit short- and long-term goals, objectives and strategies to restore and protect surface water and ground water, as appropriate.

The state's long-term goals reflect a strategically focused state NPS management program designed to achieve and maintain water quality standards and to maximize water quality benefits. The shorter-term objectives consist of activities, with annual milestones, designed to demonstrate reasonable progress toward accomplishing long-term goals as expeditiously as possible. Since the NPS management program is a longer-term planning document, the annual milestones may be more general than are expected in an annual section 319 grant work plan, but are specific enough for the state to track progress and for EPA to determine satisfactory progress in accordance with section 319(h)(8). Annual milestones in a state's NPS management program describe outcomes and key actions expected each year, e.g., delivering a certain number of WQ-10 success stories or implementing projects in a certain number of high priority impaired watersheds. The state program includes objectives that address nonpoint sources of surface water and ground water pollution as appropriate (including sources of drinking water) in alignment with the goals of the Clean Water Act. The objectives include both implementation steps and how results will be tracked (e.g., water quality improvements or load reductions).

The state program includes long-term goals and shorter-term (e.g., three- to five-year) objectives that are well integrated with other key environmental and natural resource programs, such as those described under component #3. State program goals and objectives are periodically revised as necessary to reflect progress or problems encountered, strategies to make progress towards achieving the goals, and indicators to measure progress.

2. The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and federal agencies.

The state uses a variety of formal and informal mechanisms to form and sustain these partnerships. Examples include memoranda of agreement, letters of support, cooperative projects, sharing and combining of funds, and meetings to share information and ideas.

The state NPS lead agency works collaboratively with other key state and local NPS entities in the coordinated implementation of NPS control measures in high priority watersheds. Interagency collaborative teams, NPS task forces, and representative advisory groups can be effective mechanisms for accomplishing these linkages, as can more informal but ongoing program coordination and outreach efforts. The state works to ensure that its local partners and grantees have the capacity to effectively carry out watershed implementation projects funded to support its NPS management program.

Further, the state seeks public involvement from local, regional, state, interstate, tribal and federal agencies, and public interest groups, industries, academic institutions, private landowners and producers, concerned citizens and others as appropriate, to comment on significant proposed program changes. This involvement helps ensure that environmental objectives are well integrated with those for economic stability and other social and cultural goals.

3. The state uses a combination of statewide programs and on-the-ground projects to achieve water quality benefits; efforts are well-integrated with other relevant state and federal programs.

The state has the flexibility to design its NPS management program in a manner that is best suited to achieve and maintain water quality standards. The state may achieve water quality results through a combination of watershed approaches and statewide programs, including regulatory authorities, as appropriate. The state NPS management program emphasizes a watershed management approach and includes an explanation of the state's approach to prioritizing waters and watersheds to achieve water quality restoration and protection.

The state NPS management program is well integrated with other relevant programs to restore and protect water quality, aligning priority setting processes and resources to increase efficiency and environmental results. These include the following programs, as applicable:
• Total Maximum Daily Loads (TMDLs);
• Clean Water State Revolving Fund (CWSRF);
• U.S. Department of Agriculture (USDA) farm bill conservation programs;
• state agricultural conservation;
• state nutrient framework or strategy
• source water protection;
• point sources (including storm water, confined animal feeding operations, and enforcement of permitted facilities);
• ground water;
• drinking water;
• clean lakes

• wetlands protection;
• national estuary program;
• coastal nonpoint pollution control program;
• pesticide management;
• climate change planning;
• forestry, both federal (U.S. Forest Service) and state;
• U.S. Army Corps of Engineers programs;
• and other natural resource and environmental management programs.

Because of the significant resources potentially available through USDA conservation programs, the state makes a strong sustained effort to coordinate and leverage with USDA NRCS. Similarly, a state NPS management program is well-integrated and clearly identifies processes to incorporate some of the significant resources of the CWSRF loan program for eligible nonpoint source activities.

Where applicable, the state NPS management program explains how NPS projects fit into the state's prioritization scheme for CWSRF funding, and describes state efforts to increase the use of the state CWSRF for the NPS management program. If there are barriers to prioritization of NPS projects, the state NPS management program describes efforts to coordinate with the CWSRF program and potential future steps to encourage NPS projects are considered.

If, in reviewing federal programs, the state identifies federal lands and activities that are not managed consistently with state nonpoint source program objectives, the state may seek EPA assistance to help resolve issues at the federal agency level. Federal programs subject to review by the state include the land management programs of the Bureau of Land Management and the U.S. Forest Service, USDA's conservation programs, and the U.S. Army Corps of Engineers waterway programs, as well as development projects and financial assistance programs that are, or may be, inconsistent with the state's NPS management program.

As a federal agency, EPA has a role to play in support of the state's NPS management program by working with other federal agencies to enhance their understanding of the significance of nonpoint source pollution and of the need to work cooperatively with the state to solve nonpoint source problems. Where appropriate, EPA will assist in resolving particular issues that arise between the state and federal agencies with respect to federal consistency with the state NPS management program. As EPA becomes aware of these issues, EPA works at a national level to improve consistency among federal programs.

4. The state program describes how resources will be allocated between (a) abating known water quality impairments from NPS pollution and (b) protecting threatened and high quality waters from significant threats caused by present and future NPS impacts.

The program describes its approach to addressing the twin demands of remedying waters that the state has identified as impaired by NPS pollution and preventing new water quality problems from present and reasonably foreseeable future NPS impacts, especially for waters which currently meet water quality standards.
With limited resources, the state will likely need to make choices about the relative emphasis on restoring impaired waters and protecting high quality waters. The state's program describes how it will approach setting priorities and aligning resources between these two areas of emphasis based on their water quality challenges and circumstances.

5. The state program identifies waters and watersheds impaired by NPS pollution as well as priority unimpaired waters for protection. The state establishes a process to assign priority and to progressively address identified watersheds by conducting more detailed watershed assessments, developing watershed-based plans and implementing the plans.

The state identifies waters impaired by nonpoint source pollution based on currently available information (e.g., in reports under sections 305(b), 319(a), 303(d), 314(a), and 320), and revises its list periodically as more up-to-date assessment information becomes available. As feasible, the state also identifies important unimpaired waters that are threatened or otherwise at risk from nonpoint source pollution.

In addition the state identifies the primary categories and subcategories causing the water quality impairments, threats, and risks across the state. At regular intervals the state updates the identification of waters impaired or threatened by NPS pollution preferably as part of a single comprehensive state water quality assessment which integrates reports required by the Clean Water Act. The state establishes a process to assign priority and to progressively address identified waters and watersheds by conducting more detailed watershed assessments, developing watershed-based plans, and implementing the plans. Factors used by the state to assign priority to waters and watersheds may include a variety of considerations, for example:

• human health considerations including source water protection for drinking water;
• ecosystem integrity, including ecological risk and stressors;
• beneficial uses of the water;
• value of the watershed or ground water area to the public;
• vulnerability of surface or ground water to additional environmental degradation;
• likelihood of achieving demonstrable environmental results;
• degree of understanding of the causes of impairment and solutions capable of restoring the water;
• implementability (site-specific technical feasibility);
• adequacy of existing water quality monitoring data or future monitoring commitments;
• degree to which TMDL allocations made to point sources are dependent on NPS reductions being achieved;
• extent of partnerships with other federal agencies, states, local public and private agencies/organizations and other stakeholders to coordinate resources and actions;
• availability and access of funding sources other than section 319(h); and
• readiness to proceed among stakeholders and project partners.

The state links its prioritization and implementation strategy to other programs and efforts such as those listed under component #3. In establishing priorities for ground water activities, the state considers wellhead protection areas, ground water recharge areas, and zones of significant ground water/surface water interaction, including drinking water sources.

There are different approaches for prioritizing waters for restoration and protection and EPA offers several tools to assist. For example, EPA's Recovery Potential Screening Tool, available at www.epa.gov/recoverypotential, is useful for comparing restorability of impaired waters across various watersheds. Also, the Nitrogen and Phosphorus Pollution Data Access Tool (NPDAT), at epa.gov/nutrientpollution/npdat, is a GIS-based tool designed to assist in identifying priority watersheds to address nutrient pollution.

6. The state implements all program components required by section 319(b) of the Clean Water Act, and establishes strategic approaches and adaptive management to achieve and maintain water quality standards as expeditiously as practicable. The state reviews and upgrades program components as appropriate. The state program includes a mix of regulatory, nonregulatory, financial and technical assistance, as needed.

Under section 319(b) state NPS management programs include all of the following components:

(i) An identification of measures (i.e., systems of practices) that will be used to control NPS pollution, focusing on those measures which the state believes will be most effective in achieving and maintaining water quality standards. These measures may be individually identified or presented in manuals or compendiums, provided that they are specific and are related to the category or subcategory of nonpoint sources. They may also be identified as part of a watershed approach towards achieving water quality standards, whether locally, within a watershed, or statewide;

(ii) An identification of the key programs to achieve implementation of the measures, including, as appropriate, nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects. The state is free to decide the best approaches for solving the problems that it identifies under key component #5 above. These approaches may include one or all of the following:

• watershed or water quality-based approaches aimed at meeting water quality standards directly;
• iterative, technology-based approaches based on best management practices or measures, applied on either a categorical or site-specific basis; or
• an appropriate mix of these approaches.

(iii) A description of the processes used to coordinate and, where appropriate, integrate the various programs used to implement NPS pollution controls in the state;

(iv) A schedule with goals, objectives, and annual milestones for implementation at the earliest practicable date: legal authorities to implement the program; available resources; and institutional relationships;

(v) Sources of funding from federal (other than section 319), state, local, and private sources;

(vi) Federal land management programs, development projects and financial assistance programs; and

(vii) A description of monitoring and other evaluation programs that the state will conduct to help determine short- and long-term NPS management program effectiveness.

In addition, the state incorporates existing baseline requirements established by other applicable federal or state laws to the extent that they are relevant. For example, a coastal state or territory with an approved coastal zone management program incorporates its approved state coastal nonpoint pollution control programs required by section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990, into its NPS management program since CZARA requires implementation through the state's NPS management program. In this manner, the state ensures that this program and other relevant baseline programs are integrated into, and consistent with, section 319 programs.

7. The state manages and implements its NPS management program efficiently and effectively, including necessary financial management.

The state implements its program to solve its water quality problems as effectively and expeditiously as possible, and makes satisfactory progress each year in meeting program goals. To help assure that priority water quality problems are addressed cost-effectively and in a timely manner, the state includes in its program a process for identifying priority problems and/or watersheds, and deploys resources in a timely fashion to address priorities, including any critical areas requiring treatment and protection within watersheds.

The state employs appropriate programmatic and financial systems that ensure section 319 dollars are used efficiently and consistent with its legal obligations, and generally manages all section 319 funds to maximize water quality benefits. The state ensures that section 319 funds complement and leverage funds available for technical and financial assistance from other federal sources and agencies.

8. The state reviews and evaluates its NPS management program using environmental and functional measures of success, and revises its NPS management program at least every five years.

The state establishes appropriate measures of progress in meeting programmatic and water quality goals and objectives identified in key component #1 above. The state also describes a monitoring/evaluation strategy and a schedule to measure success in meeting those goals and objectives. The state integrates monitoring and evaluation strategies with ongoing federal natural resource inventories and monitoring programs.

The state NPS management program is reviewed and revised every five years. The revision is not necessarily a comprehensive update unless significant program changes warrant a complete revision; instead, an update targets the parts of the program that are out-of-date. At a minimum, this includes updating annual milestones and the schedule for program implementation, so that they remain current and oriented toward achieving water quality goals.

Appendix C

Geologic Timeline

ERA	PERIOD/ SYSTEM		MILLIONS YEARS AGO	PREDOMINANT ROCK TYPES IN INDIANA	PRINCIPAL FOSSIL TYPES IN INDIANA
CENOZOIC	QUATERNARY		2.6	Unconsolidated deposits - glacial till, sand, gravel, silt, marl, clay, and peat deposited during and after continental glaciation	Mastodon, mammoth, peccary, dire wolf, saber-toothed cat, gastropods, pelecypods, plants, and pollen
	TERTIARY		65.5	Unconsolidated sediment consisting of clay, mud, gravel, sand, and silt	Short-faced bear, peccary, camels, snakes, rodents, fishes, birds, and turtles
MESOZOIC	CRETACEOUS		145.5	None present	None present
	JURASSIC		199.6	None present	None present
	TRIASSIC		251	None present	None present
PALEOZOIC	PERMIAN		299	None present	None present
	CARBONIFEROUS	PENNSYL-VANIAN	318.1	Shale, sandstone, mudstone, clay, coal, limestone, and conglomerate	Lycopods, *Calamites*, seed ferns, true ferns, *Cordaites*, and amphibians
		MISSIS-SIPPIAN	359.2	Shale, sandstone, siltstone, limestone, and gypsum	Crinoids, brachiopods, cephalopods, corals, molluscs, trilobites, bryozoans, fishes, arthropods, and foraminifera
	DEVONIAN		416	Upper part: carbonaceous shale Lower part: limestone, dolostone, and shale	Corals, brachiopods, cephalopods, trilobites, pelecypods, and bryozoans
	SILURIAN		443.7	Dolostone, limestone, siltstone, and shale	Corals, stromatoporoids, bryozoans, brachiopods, trilobites, gastropods, pelecypods, crinoids, and eurypterids
	ORDOVICIAN		488.3	Upper part: shale and limestone Lower part: limestone, dolostone, and sandstone*	Cephalopods, trilobites, brachiopods, bryozoans, crinoids, pelecypods, and gastropods
	CAMBRIAN		542	Sandstone and dolostone*	Trilobites, brachiopods, and sponges
PRECAMBRIAN			4,600	Granite, marble, gneiss, and other igneous and metamorphic rock types*	Microbes

* Present only in the subsurface

Geologic time dates from U.S. Geological Survey, 2010, Divisions of geologic time—major chronostratigraphic and geochronologic units: U.S. Geological Survey Fact Sheet 2010-3059.

Indiana Geological Survey
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Bloomington, IN 47405-2208
(812) 855-7636
IGSinfo@indiana.edu
http://IGS.indiana.edu

Appendix D

Indiana Designated MS4 Entities Currently Permitted

County	MS4 Entity	Permit Number	Phone
Adams	Decatur	INR040055	260-724-4218
Allen	City of Fort Wayne; IPFW; Ivy Tech North East; Indiana Institute of Technology; University of St. Francis	Co-Permitees INR040029	260-427-5066
Allen	City of New Haven	INR040063	260-748-7031
Allen	Allen County; Huntertown; Leo-Cedarville	Co-Permitees INR040131	260-449-3612
Bartholomew	Bartholomew County	INR040097	812-379-1660
Bartholomew	City of Columbus	INR040098	812-376-2540
Boone	Town of Zionsville	INR040035	317-873-4544
Boone	City of Lebanon	INR040113	765-482-8823
Boone	Boone County	INR040133	765-483-4444
Cass	City of Logansport	INR040043	574-753-6231
Clark	Oak Park Conservancy District	INR040001	813-283-3960
Clark	Town of Clarksville	INR040076	812-283-8233
Clark	Town of Sellersburg	INR040116	812-246-3821
Clark	City of Jeffersonville	INR040117	812-280-4730
Clark	Clark County	INR040118	812-288-2161
Clinton	City of Frankfort	INR040020	765-659-4741
Daviess	City of Washington	INR040095	812-254-2792
Dearborn	Hidden Valley Lake CDP	INR040009	812-537-3091
Decatur	City of Greensburg	INR040091	812-663-2138
DeKalb	City of Auburn	INR040119	260-925-1714
Delaware	Delaware County; City of Muncie; City of Yorktown; Ivy Tech State College	Co-Permitees INR040056	765-749-1114
Delaware	Ball State University	INR040084	765-285-5092
Delaware	Town of Daleville	INR040110	765-378-6288
Dubois	City of Jasper	INR040067	812-482-4255
Elkhart	Elkhart County; City of Elkhart; City of Goshen; Town of Bristol	Co-Permitees INR040137	574-533-3630 ext 3
Fayette	City of Connersville	INR040021	765-825-2158
Floyd	City of New Albany	INR040077	812-946-5333
Floyd	Floyd County	INR040078	812-948-5466
Floyd	Town of Georgetown	INR040096	812-951-3800
Floyd	IU -Southeast, New Albany	INR040147	812-855-6311
Grant	City of Marion; Indiana-Wesleyan University	Co-Permitees INR040033	765-668-4441
Hamilton	Town of Arcadia	INR040004	317-984-3512
Hamilton	Town of Fishers	INR040019	317-595-3461
Hamilton	Hamilton County; Town of Cicero	Co-Permitees INR040066	317-776-8495
Hamilton	City of Westfield	INR040109	317-896-5452
Hamilton	City of Noblesville	INR040127	317-770-5132
Hamilton	City of Carmel	INR040150	317-571-2314
Hancock	Town of McCordsville	INR040006	317-335-3493

Hancock	City of Greenfield	INR040039	317-477-4320
Hancock	Town of New Palestine	INR040070	317-861-4727
Hancock	Town of Fortville	INR040071	317-485-4044
Hancock	Hancock County	INR040128	317-477-1150
Hendricks	Town of Brownsburg	INR040002	317-852-1114
Hendricks	Town of Plainfield	INR040050	317-839-3490
Hendricks	Town of Avon	INR040086	317-272-0948
Hendricks	Plainfield Correctional Facility	INR040122	317-839-2513 Ext 2451
Hendricks	Hendricks County	INR040125	317-718-6038
Hendricks	Town of Danville	INR040126	317-745-3012
Hendricks	Town of Pittsboro	INR040132	317-892-3326
Henry	City of New Castle	INR040038	765-521-6836
Howard	Howard County	INR040048	765-456-2217
Howard	City of Kokomo	INR040104	765-456-7468
Howard	IU -Kokomo	INR040148	812-855-6311
Huntington	City of Huntington	INR040011	260-358-2313
Jackson	City of Seymour	INR040082	812-522-4020
Jefferson	City of Madison	INR040061	812-265-8326
Johnson	Town of Bargersville	INR040024	317-422-5115
Johnson	City of Greenwood	INR040032	317-887-5230
Johnson	Town of New Whiteland	INR040042	317-535-4664
Johnson	Johnson County	INR040045	317-346-4350
Johnson	Town of Whiteland	INR040052	317-535-5531, ext 222
Johnson	City of Franklin	INR040059	317-3461280
Johnson	Town of Edinburgh	INR04026	812-526-3510
Knox	City of Vincennes	INR040034	812-882-7877
Kosciusko	City of Warsaw	INR040080	574-372-9580
Lake	Lakes of the Four Seasons POA	INR040007	219-988-2581
Lake	Town of Munster	INR040017	219- 836-6995
Lake	City of Hammond	INR040018	219-853-6413 Ext 524
Lake	Town of New Chicago	INR040031	219-962-1157
Lake	Town of Lowell	INR040046	219-696-7794
Lake	Town of St. John	INR040047	219-365-4655
Lake	Town of Merrillville	INR040049	219-769-4670
Lake	City of Crown Point	INR040054	219-661-2280
Lake	Town of Dyer	INR040074	219-865-6108
Lake	Town of Cedar Lake	INR040075	219-374-7400
Lake	City of Lake Station	INR040087	219-962-2081
Lake	City of Gary; Ivy Tech State College-Northwest	Co-Permitees INR040101	219-882-3000
Lake	Town of Griffith	INR040108	219-924-3838
Lake	Town of Schererville	INR040112	219-322-2211
Lake	Lake County	INR040124	219-755-3745
Lake	City of Hobart	INR040130	219-942-3619
Lake	Town of Highland	INR040135	219-972-5069
Lake	City of East Chicago	INR040141	219-391-8773
Lake	IU -Northwest, Gary	INR040145	812-855-6311
LaPorte	LaPorte County; City of LaPorte; City of Michigan City; Town of Trail Creek; Town of Long Beach	Co-Permitees INR040107	219-362-6633, ext 3

LaPorte	Indiana State Prison	INR040120	219-874-7256 Ext 2410
Lawrence	City of Bedford	INR040027	812-275-1641
Madison	Town of Pendleton	INR040014	765-778-4100
Madison	City of Anderson; Anderson University	Co-Permitees INR040016	765-648-6118
Madison	Town of Edgewood	INR040025	260-224-9738
Madison	Town of Ingalls	INR040072	317-485-4321
Madison	Madison County	INR040111	765-641-9639
Madison	Pendleton Correctional Facility	INR040121	765-778-8011 Ext 1010
Madison	City of Alexandria	INR040142	765-724-4733
Madison	Town of Chesterfield	INR040143	765-378-3331
Marion	City of Southport	INR040015	317-786-3585
Marion	Town of Cumberland	INR040022	317-894-6210
Marion	City of Beech Grove	INR040023	317-788-4982
Marion	Town of Speedway	INR040040	317-246-2855
Marion	City of Lawrence	INR040069	317-339-0623
Marshall	City of Plymouth	INR040064	574-936-6717
Miami	City of Peru	INR040081	765-473-7651
Monroe	Ivy Tech Community College-Bloomington	INR040003	812-320-6059
Monroe	Town of Ellettsville	INR040013	812-332-8030
Monroe	Monroe County	INR040089	812- 349-2499
Monroe	Indiana University-Bloomington	INR040123	812-855-0857
Monroe	City of Bloomington	INR040136	812-349-3650
Montgomery	City of Crawfordsville	INR040094	765-364-5152
Morgan	Morgan County; City of Martinsville; City of Mooresville; Town of Brooklyn; Tri-County Conservancy District	Co-Permitees INR040099	765-342-1077
Noble	City of Kendallville	INR040012	260-347-1362
Porter	Twin Creeks Conservancy District	INR040079	219-759-3277
Porter	City of Portage	INR040090	219-762-1815
Porter	Valparaiso Lakes Conservancy District	INR040103	219-464-3770
Porter	Town of Porter	INR040115	219-926-2771
Porter	Porter County	INR040140	219-465-3560
Porter	Nature Works Conservancy District (Aberdeen Homeowners Association)	INR040149	219-464-3536
Porter	City of Valparaiso; Valparaiso University	Co-Permitees INR04073	219-462-1161, ext 316
Porter	Town of Chesterton	INR040036	219-728-1336, ext 2
Putman	City of Greencastle	INR040102	765-655-2301
Randolph	Town of Parker City	INR040093	765-486-7949
Saint Joseph	IU -South Bend	INR040146	574-520-4499
Saint Joseph	St. Joseph County; Town of Osceola; Town of Roseland	Co-Permitees INR040041	572 - 235-9626
Saint Joseph	University of Notre Dame	INR040105	574- 631-6594
Saint Joseph	Mishawaka; Bethel College	Co-Permitees INR040106	574-258-1655
Saint Joseph	City of South Bend; Ivy Tech State College – North Central	Co-Permitees INR040114	574-235-9261
Saint Joseph	Saint Mary's College	INR040139	574- 284-5778
Shelby	City of Shelbyville	INR040051	317-392-5102
Steuben	City of Angola; Trine University	Co-Permitees INR040005	260-665-2514

Tippecanoe	Tippecanoe County; Town of Battle Ground; City of Lafayette; City of West Lafayette; Town of Dayton; Purdue University; Ivy Tech State College - Lafayette	Co-Permitees INR040129	765-423-9228
Vanderburgh	University of Southern Indiana	INR040028	812- 464-1849
Vanderburgh	Vanderburgh County	INR040030	812-435-5773
Vanderburgh	City of Evansville	INR040057	812-436-4977
Vanderburgh	University of Evansville	INR040058	812-488-2721
Vanderburgh	Ivy Tech Community College-Southwest	INR040060	812-429-1389
Vigo	City of Terre Haute; Vigo County; Town of West Terre Haute; Town of Seelyville; Indiana State University; Rose-Hulman Institute of Technology; Honey Creek Vigo Conservancy District; Ivy Tech Community College – Terre Haute	Co-Permitees INR040092	812-232-6564
Vigo	US Penitentiary-Terre Haute	INR040138	812-238-3437
Wabash	City of Wabash	INR040037	260-563-2941
Warrick	Town of Chandler	INR040053	812-925-6882
Warrick	Town of Newburgh	INR040062	812-853-2728
Warrick	Warrick County	INR040065	812-897-6094
Wayne	IU - East, Richmond	INR040144	812-855-6311
Wayne	City of Richmond; Earlham College	Co-Permitees INR040044	765- 983-7238

Appendix E

IDEM Watershed Management Plan (WMP) Checklist (2009)

Name of Project:		
WMP Draft Date:		
IDEM Reviewers:	**WMP Review Date:**	
1.	**2.**	**3.**

Instructions: The numbered elements (1-33) make up the IDEM WMP Checklist (2009). The items with boxes are the requirements needed to meet the numbered elements. These items come directly from the WMP Checklist instructions. The WMP cannot be approved until all numbered elements are complete.

Page(s) #	Required Content
WATERSHED COMMUNITY INITIATIVE	
	1. The reasons the community decided to initiate this watershed project. ☐ Explain the concerns that led leaders to initiate the project ☐ Explain who the local leaders are ☐ Explain how/why they decided to work together *Comments:*
	2. A description of the steering committee and who they represent. ☐ Explain how stakeholder involvement was generated ☐ Explain how additional stakeholder concerns were gathered ☐ In a figure include: ☐ Title ☐ Number ☐ Title and Number in Table of Contents ☐ Figure is legible ☐ A list of the steering committee members and their affiliation ☐ Describe any outreach efforts used to generate stakeholder involvement *Comments:*
	3. A list of stakeholder concerns. ☐ In a figure include: ☐ Title ☐ Number ☐ Title and Number in Table of Contents ☐ Figure is legible ☐ A list of concerns from the steering committee and the stakeholders *Comments:*
WATERSHED INVENTORY	
	Part One of the Watershed Inventory:

4. A description of the geology/topography as it pertains to the watershed.

☐ Explain karst magnitude and general distribution

☐ Not applicable

☐ Explain the topographic features that define the watershed's drainage patterns

Comments:

5. A brief overview of the hydrology as it pertains to the watershed.

☐ Map(s) of project area showing:

☐ Labeled Streams	☐ Lakes
☐ Watershed names and boundaries	☐ HUCs
☐ Legal drains	☐ Wetlands
☐ Labeled Population centers ☐ Not applicable	☐ Labeled Major roads ☐ Not applicable
☐ County boundaries	☐ North arrow
☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Not smaller than 40 square inches
☐ Legend	☐ Scale

☐ Explain how the following resources are used by the public:

☐ Streams	☐ Lakes
☐ Ditches	☐ Legal drains
☐ Wetlands	

☐ Where possible, connect hydrologic characteristics and relevant stakeholder concerns

☐ Quantify:

☐ Streams in miles	☐ Ditches in miles
☐ Legal drains in miles	☐ Wetlands in acreage
☐ Lakes by number in the watershed and estimated total acreage	

☐ Describe hydrologic modifications within the watershed

Comments:

6. Soil characteristics that can affect water quality including, but not limited to, highly erodible soil (HES), hydric soils, and septic system suitability.

☐ Explain how soil characteristics impact water quality in the watershed

☐ Not Applicable

☐ Where possible, connect soil characteristics and relevant stakeholder concerns

☐ Not Applicable

☐ Map(s) of the project area showing:

☐ Labeled Streams ☐ Not applicable	☐ Labeled Population centers ☐ Not applicable
☐ Labeled Major roads ☐ Not applicable	☐ Title
☐ Number	☐ Not smaller than 40 square inches
☐ Title and Number in Table of Contents	☐ Legend
☐ North arrow	☐ Scale
☐ HES	☐ Hydric soils
☐ Septic system suitability	

☐ Quantify according to the percentage of total watershed area they cover:

☐ HES

☐ Hydric soils

☐ Septic system suitability
☐ Include tillage transect information
☐ Not Applicable
☐ Describe unsewered areas
☐ Map(s) of project area showing:

☐ Labeled Streams ☐ Not applicable	☐ Labeled Population centers ☐ Not applicable
☐ Labeled Major roads ☐ Not applicable	☐ Title
☐ Number	☐ Title and Number in Table of Contents
☐ Not smaller than 40 square inches	☐ Legend
☐ Scale	☐ North arrow
☐ Large unsewered communities	

Comments:

7. A description of land use in the watershed.

☐ Map(s) of the project area showing:

☐ North arrow	☐ Labeled Streams ☐ Not applicable
☐ Labeled Population centers ☐ Not applicable	☐ Labeled Major roads ☐ Not applicable
☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Not smaller than 40 square inches
☐ Legend	☐ Scale
☐ Land use layers pertinent to the watershed and stakeholder concerns.	

☐ Quantify in acreage and percent of the watershed, the mapped land uses
☐ Explain how current land uses or land use trends can potentially impact water quality
☐ Where possible, connect land use and relevant stakeholder concerns
☐ Not Applicable
☐ Explain the uses of fertilizer on urban and suburban land
☐ Not Applicable
☐ Explain where pet and/or wildlife waste may be an issue
☐ Not Applicable

Comments:

8. Other planning efforts in the watershed project area.

☐ Explain how other planning efforts impact water quality in the watershed
☐ Not Applicable
☐ Where possible, connect planning efforts and relevant stakeholder concerns
☐ Not Applicable
☐ Map(s) of the project area showing:
☐ Not Applicable

☐ Labeled Streams ☐ Not applicable	☐ Labeled Population centers ☐ Not applicable
☐ Labeled Major roads ☐ Not applicable	☐ Title
☐ Number	☐ Title and Number in Table of Contents
☐ Not smaller than 40 square inches	☐ Legend
☐ Scale	☐ North arrow
☐ Areas in need of Rule 5 enforcement and/or areas of unmanaged construction/sprawl	

Include on the map(s) the jurisdiction of:

☐ MS4 Plans ☐ Not Applicable	☐ Regional Sewer District Plans ☐ Not Applicable
☐ City/County Master Plans ☐ Not Applicable	☐ TMDL Reports ☐ Not Applicable
☐ Other WMPs ☐ Not Applicable	☐ Urban Retrofit Plans ☐ Not Applicable
☐ Ground water and/or Source Water Protection Plans ☐ Not Applicable	

Comments:

9. ☐ An identification of threatened and endangered plants and animals that may be found in the watershed and a description of the types of habitat they prefer.

Comments:

10. ☐ A description of the relevant relationships between the characteristics discussed in elements 4 through 9.

Comments:

Part Two of the Watershed Inventory:

☐ A section discussing checklist elements 12-14 for each 12 digit HUC. If the project is at the 10 digit scale, 12 digit HUCs may be combined into sections.

☐ Each section has a map of the applicable subwatershed(s) and all required map information from elements 11-14 may go on these maps

☐ Labeled Streams ☐ Not applicable	☐ Labeled Population centers ☐ Not applicable
☐ Labeled Major roads ☐ Not applicable	☐ Title
☐ Number	☐ Title and Number in Table of Contents
☐ Not smaller than 40 square inches	☐ Legend
☐ Scale	☐ North arrow

Comments:

11. Data and Targets.

☐ For each report, plan, or document whose data is used:

- ☐ Explain the background of the data
- ☐ State the data's age
- ☐ State how often those data were collected

☐ Explain methodologies for collecting:

☐ Windshield survey (Watershed Inventory must include a windshield survey or desktop survey) ☐ Not Applicable	☐ Desktop survey (Watershed Inventory must include a windshield survey or desktop survey) ☐ Not Applicable
☐ Habitat data	☐ Biological data

☐ In a figure include:

☐ Targets for water quality parameters of concern	☐ Targets for habitat data
☐ Targets for biological data	☐ Title
☐ Number	☐ Title and Number in Table of Contents
☐ Figure is legible	☐ Legend

☐ If an Indiana State Standard exists for a parameter of concern, target must be at least as stringent as that standard

☐ Not Applicable

☐ If a NPS TMDL exists for the watershed, target must be at least as stringent as the NPS TMDL target

☐ Not Applicable

☐ On the appropriate subwatershed map, include your sampling locations and locations from other data as appropriate

Comments:

12. Water Quality Information.

☐ Discuss data pertaining to all concerns

☐ Summarize and discuss data from:

☐ 305b and 303d lists ☐ Not Applicable	☐ TMDL Reports ☐ Not Applicable
☐ OLQ surface water data ☐ Not Applicable	☐ Assessment Branch surface water data ☐ Not Applicable
☐ LARE Studies ☐ Not Applicable	☐ NPDES facilities ☐ Not Applicable
☐ Permit compliance ☐ Not Applicable	☐ Other WMPs ☐ Not Applicable
☐ USGS ☐ Not Applicable	☐ Flow gauges ☐ Not Applicable
☐ Project data ☐ Not Applicable	

☐ On the appropriate subwatershed map, include impaired waterbodies

Comments:

13. Habitat/Biological Information.

☐ Discuss data pertaining to all concerns

☐ Summarize and discuss data from:

☐ 305b and 303d lists ☐ Not Applicable	☐ TMDL Reports ☐ Not Applicable
☐ OLQ surface water data ☐ Not Applicable	☐ Assessment Branch surface water data ☐ Not Applicable
☐ LARE Studies ☐ Not Applicable	☐ NPDES facilities ☐ Not Applicable
☐ Permit compliance ☐ Not Applicable	☐ Other WMPs ☐ Not Applicable
☐ USGS ☐ Not Applicable	☐ Flow gauges ☐ Not Applicable
☐ Project data ☐ Not Applicable	

☐ Data from a desktop and/or windshield survey

☐ Not Applicable to Habitat/Biological Information

Comments:

14. Land use Information.

☐ Discuss data pertaining to all concerns
☐ Include data from a desktop and/or windshield survey
☐ Discuss, at a minimum:

☐ Open space	☐ Industry
☐ Areas slated for development	☐ Land use trends

☐ Describe and map on the appropriate subwatershed map(s):

☐ Stream miles needing buffers ☐ Not Applicable	☐ Stream banks needing stabilization ☐ Not Applicable
☐ Brownfields ☐ Not Applicable	☐ LUSTs ☐ Not Applicable
☐ Other remediation sites ☐ Not Applicable	

☐ Describe:
- ☐ Fertilizer use on non urban/suburban land uses ☐ Not Applicable
- ☐ Hobby farms and other AFOs ☐ Not Applicable
- ☐ Application of municipal wastewater sludge ☐ Not Applicable

☐ Quantify and then map on the appropriate subwatershed map(s):

☐ CSOs ☐ Not Applicable	☐ SSOs ☐ Not Applicable
☐ CAFOs ☐ Not Applicable	☐ CFOs ☐ Not Applicable
☐ Other non agricultural animal operations ☐ Not Applicable	

Comments:

Part Three of the Watershed Inventory:

15. Watershed Inventory Summary.

☐ Summarize important findings, relationships, or trends
☐ Map(s) of the project area or subwatersheds showing:

☐ Labeled Streams ☐ Not applicable	☐ Labeled Population centers ☐ Not applicable
☐ Labeled Major roads ☐ Not applicable	☐ Title
☐ Number	☐ Title and Number in Table of Contents
☐ Not smaller than 40 square inches	☐ Legend
☐ Scale	☐ North arrow
☐ Important water quality and habitat/biology results	

Comments:

16. Analysis of Stakeholder Concerns.

☐ In a figure include:

☐ Title	☐ Number

☐ Title and Number in Table of Contents	☐ Figure is legible
☐ Each concern	☐ Whether the concern's supported by data
☐ Evidence for each concern	☐ If the concern is quantifiable
☐ If the concern is outside the project's scope	☐ Which concerns will be focused on

☐ Explain why concerns supported by data will not be focused on

☐ Not Applicable

Comments:

IDENTIFY PROBLEMS AND CAUSES

17. Problems that reflect the concerns on which the group has chosen to focus.

☐ In a figure include:

☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Figure is legible
☐ The concerns	☐ Problems related to the concerns

Comments:

18. The potential cause(s) for each identified problem.

☐ In a figure include:

☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Figure is legible
☐ The problems	☐ Potential causes. Causes must be a specific pollutant parameter, but secondary causes may also be identified.

Comments:

IDENTIFY SOURCES AND CALCULATE LOADS

19. Potential sources for each pollution problem.

☐ In a figure include:

☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Figure is legible
☐ Sources paired with: ☐ Appropriate environmental problems ☐ Causes ☐ Subwatersheds	
☐ Provide enough information to explain the magnitude of the source	

Comments:

20. Current loads for each pollutant identified as a problem's cause.

☐ In a figure include:

☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Figure is legible
☐ All current loads for pollutants identified as a problem's cause	

Comments:

21. The load reduction needed to achieve the target pollutant load.

☐ In a figure include:

☐ Title	☐ Number
☐ Title and Number in Table of Contents	☐ Figure is legible
☐ The current loads	☐ The target loads

	☐ The reductions needed to meet the target load *Comments:*
SET GOALS AND IDENTIFY CRITICAL AREAS	
	22. Water quality improvement or protection goal statements based on the calculated loads. Social and/or administrative goal statements may also be developed. ☐ Goal statements include: ☐ Problem or pollutant — ☐ Current pollutant load or level for water quality goal statements or current condition of the problem for social/administrative goal statements ☐ Target pollutant load, level, or condition of the problem — ☐ Timeframe for goal completeness ☐ If water quality standards exist for a pollutant, the goal, at a minimum, must be to meet that standard ☐ Not applicable ☐ If a NPS TMDL has been developed for the watershed, the goal, at a minimum, must be designed to achieve the reduction in pollutant load called for in the NPS TMDL ☐ Not applicable *Comments:*
	23. An indicator that can be measured for each goal in order to determine whether progress is being made toward achieving that goal. ☐ Water quality restoration goal indicators show environmental changes in the aquatic ecosystem or water chemistry ☐ Non-water quality restoration goal indicators show administrative success or social change ☐ Not applicable *Comments:*
	24. Critical areas where implementation will be needed within the watershed project area. ☐ Identify critical areas ☐ Describe the specific water quality pollutant(s) and source(s) in each critical area ☐ Critical areas conform to the definition in the Checklist Instructions ☐ Map(s) of project area or subwatersheds showing: ☐ Labeled Streams ☐ Not applicable — ☐ Labeled Population centers ☐ Not applicable ☐ Labeled Major roads ☐ Not applicable — ☐ Title ☐ Number — ☐ Title and Number in Table of Contents ☐ Not smaller than 40 square inches — ☐ Legend ☐ Scale — ☐ North arrow ☐ All critical areas *Comments:*
CHOOSE MEASURES /BMPS TO APPLY	
	25. A description of best management practices (BMPs) or measures that would be appropriate to address the goals. ☐ In a figure include: ☐ Title — ☐ Number ☐ Title and Number in Table of Contents — ☐ Figure is legible ☐ BMPs and measures appropriate for each critical area — ☐ Identify why that area was designated critical

	Comments:
	26. The load reduction expected for each BMP. ☐ Calculate load reductions for applicable BMPs and include in element 25's figure. *Comments:*
ACTION REGISTER & SCHEDULE	
	27. A series of objectives scheduled to achieve each goal. ☐ Identify objectives designed to achieve the goals determined in element 22 ☐ The objectives should incorporate the BMPs or measures listed in element 25 ☐ Identify audiences for each objective *Comments:*
	28. Interim measurable milestones for determining whether each objective is being implemented according to the schedule. ☐ Milestones for early stages of implementation ☐ Milestones for later stages of implementation *Comments:*
	29. An estimate of financial cost (in dollar amount) for each objective. ☐ List financial estimates for BMPs and outreach activities, salary, promotional costs, technical costs, travel, training, etc. *Comments:*
	30. ☐ Determine possible partners to implement each objective. *Comments:*
	31. Technical assistance needed to implement the plan. ☐ Explain the technical assistance needed and who will provide it. *Comments:*
	☐ Information from elements 27-31 are in a Action Register: ☐ Title ☐ Number ☐ Title and Number in Table of Contents ☐ Figure is legible *Comments:*
TRACKING EFFECTIVENESS	
	32. A strategy to track each goal's indicators and evaluate the effectiveness of the implementation efforts over time. ☐ Method that tracks water quality indicators through monitoring, modeling load reductions, or other method documenting environmental change. Social and administrative indicators are tracked through databases, surveys, marketing tools, or other methods. ☐ Explain: ☐ How indicators are tracked ☐ The cost ☐ Tracking schedule ☐ Possible partners ☐ Technical assistance needed to track indicators *Comments:*
	33. A description of future WMP activity. ☐ Criteria for when WMP will be revised ☐ Project contact information ☐ Describe: ☐ When the WMP will be re-evaluated ☐ Who will be responsible for the re-evaluating and revisions *Comments:*

Appendix F

IDEM-Approved Watershed Management Plans

No.	Name	HUC(s)
1.	Bacon Prairie WMP	05120201080060
2.	Baugo Creek WMP	040500012300l0- 040
3.	Beanblossom Creek WMP	05120202010
4.	Big Creek WMP	05120113110
5.	Big Walnut WMP	05120203010-050
6.	Brandywine Creek WMP	0512020403
7.	Buck Creek WMP	05120201080040
8.	Busseron Creek WMP	0512011115
9.	Cedar Creek WMP	04100003080-090
10.	Central Muscatatuck WMP	0512020701, 0512020706
11.	Clifty Creek WMP	0512020601
12.	Coffee Creek WMP*	040400010600l0*
13.	Conns Creek WMP	05120205040
14.	Cool Creek WMP	05120201090030
15.	Cordry-Sweetwater WMP	05120204100020, 05120208050010
16.	Daviess Co Prairie Creek WMP	05120202080
17.	Duck Creek WMP	05120201060
18.	Dunes Creek WMP*	040400010800l0*
19.	Eagle Creek WMP w/Revision	05120201120
20.	Eel River- Tick Creek WMP	05120104070060
21.	Elkhart River WMP	040500011l0-210
22.	Elkhart River-Yellow Creek (lower) WMP	040500011900l0, -030, -040, -070; 040500012001l0; 040500012100l0, -040, -050, -060; 040500012300l0
23.	Five Lakes WMP	040500011700l0-030
24.	Flat Lake WMP	07120001060070
25.	Flatrock-Haw Creek WMP	0512020506
26.	Galena River WMP	0404000110*
27.	Garrison Creek WMP	05080003040100
28.	Geist Reservoir Upper Fall Creek WMP	0512020108
29.	Highland-Pigeon WMP	05140202010020, -030; 05140202020, -030, -040, -070; 05140202050010; 05140202100040
30.	Hobart Deep River-Turkey Creek WMP*	040400010l0*
31.	Hogan Creek WMP	05090203040
32.	Indian Creek (Harrison Co) WMP	05140104080-100
33.	Indian Creek WMP (Historic Hoosier Hills)	05090203200
34.	Indian Creek WMP (Johnson County)	05120201170
35.	Kessinger Ditch WMP	05120202090040-060
36.	Lake Maxinkuckee WMP	05120106060010

No.	Name	HUC(s)
37.	Lick Creek WMP	05080003040020
38.	Lilly Little Duck WMP	05120201050060; 05120201060020
39.	Limberlost-Loblolly WMP	05120101050010-060
40.	Little Blue River WMP	05120204030
41.	Little Calumet WMP*	04040001040020*, -030*; 07120003030050
42.	Little Cicero WMP	05120201080080, -090
43.	Little Deer Creek Headwaters WMP	05120105050040
44.	Little Elkhart River WMP	04050001140010-030
45.	Little Elkhart Addendum	04050001140040-070
46.	Little Sugar Creek WMP	05120110040020-030
47.	Little Vermillion WMP	05120108140040-060
48.	Lower Eel	05120203080-090
49.	Lower Fall Creek WMP	05120201110
50.	Lower Patoka WMP	05120209070-080
51.	Lower St. Joseph – Bear Creek WMP	04100003070; 04100003100
52.	Lower White Lick Creek WMP	05120201150130, -060, -070, -080
53.	Middle Eel River WMP	0512010405-06
54.	Middle Fork Whitewater WMP	05080003070030-040
55.	Middle Patoka River WMP	0512020902-06
56.	Middle St. Joseph River WMP	0410000305
57.	Morse Reservoir Cicero Creek	0512020106
58.	Mud Creek	05120204100020
59.	Owen Co WMP	05120202020010-030
60.	Patoka Lake SWPP	05120209010
61.	Pigeon Creek WMP	04050001110020-080
62.	Pitcher Lake WMP	05120113120010
63.	Pleasant Run WMP	051202011205
64.	Puterbaugh Cr –Heaton Lake WMP	040500012003
65.	Region of the Great Bend of the Wabash River WMP	05120101801; 0512010802; 0512010805
66.	S Fork Wildcat Blinn Ditch WMP	05120107040040; 05120107040090
67.	Salt Creek WMP*	04040001050*
68.	Sand Creek WMP	05120206030
69.	Silver Creek WMP	0514010108
70.	South Fork Wildcat Creek WMP	051201070301-11,
71.	South Laughery WMP	05090203070-080
72.	St. Joseph River (OH) WMP	04100003
73.	St. Joseph River (MI) WMP	04050001
74.	St. Marys River WMP	04100004 (IN only)
75.	Stony Creek WMP	05120201070040-070
76.	Sugar Creek WMP	05120204060
77.	Swanfeld Ditch WMP	05120201050080
78.	Tanners Creek WMP	05090203030
79.	Trail Creek WMP*	040400010103-05*

No.	Name	HUC(s)
80.	Turtle Creek WMP	05120111150020, -030
81.	Upper Patoka River WMP	05120209020
82.	Upper Tippecanoe WMP	05120106010
83.	Upper Wabash WMP	Indiana portions of 05120101010, 05120101040, 05120101050, 0512011060
84.	Upper White River WMP	051202010303, 051202010305, 051202010110, 0512020101111
85.	White R – Lambs Creek WMP	05120201160
86.	Mud Creek Headwaters WMP	05120107010030
87.	Pete's Run WMP	05120107020070
88.	Turkey Askren Round Prairie WMP	05120107010060
89.	West Fork Whitewater River WMP	0508000301-03
90.	Wildcat Kilmore Creek Stump Ditch WMP	05120107040070
91.	Wildcat Creek Lauramie Creek WMP	05120107040120
92.	Wildcat Creek Little Wildcat Creek WMP	05120107020020
93.	Wildcat Creek Spring Creek – Lick Run WMP	05120107040100
94.	Wildcat Creek Stahl Ditch – Kitty Run WMP	05120107020010; 05120107010100
95.	Wildcat Jerome East WMP	05120107010080
96.	Yellowwood Lake WMP	05120108050060
97.	Youngs Creek WMP	05120204090

*Coastal Zone WMPs

Appendix G

STATE OF INDIANA
OFFICE OF THE ATTORNEY GENERAL
INDIANA GOVERNMENT CENTER SOUTH, FIFTH FLOOR
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INDIANA ATTORNEY GENERAL

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January 9, 2013

Mike Molnar
Program Manager
Lake Michigan Coastal Program
Indiana Department of Natural Resources
402 West Washington Street, Room W267
Indianapolis, IN 46204

RE: Authority to prevent and control non-point source pollution; *Advisory Letter #12-35*

Dear Mr. Molnar:

The Department of Natural Resources (DNR) requested an opinion from our office regarding whether the Indiana Department of Environmental Management (IDEM) has authority under applicable statutes and rules to prevent and control non-point source pollution within Indiana. We understand that such an opinion is necessary for joint approval of the state's non-point pollution control program by the National Oceanic and Atmospheric Administration and the U.S. Environmental Protection Agency pursuant to Section 6217 of the Federal Coastal Zone Act Reauthorization Amendments of 1990, 16 U.S.C. 1455, P.L. 101-508.

BRIEF ANSWER

In response to DNR's request we can provide the following opinion confirming that IDEM has the relevant authority in this regard based on permitting laws and related authority to require adequate control of resource management measures.

ANALYSIS

IDEM is the agency within the State of Indiana designated to implement both the Clean Water Act and the Safe Drinking Water Act. As such, IDEM has been granted broad general authority to secure the benefits of these federal Acts and secure compliance therewith. Additionally, a number of state statutes provide IDEM with broad regulatory authority over pollution control and abatement.

IC 13-18-3-1 requires the Water Pollution Control Board (WPCB) [1] to adopt rules for the control and prevention of pollution to Indiana's waters. Additionally, IC 13-18-3-11 provides that all water pollution control laws shall be liberally construed to effectuate the purposes of those laws. For instance, IC 13-18-4-5 states that "a person may not throw, run, drain, or otherwise dispose; or cause, permit, or suffer to be thrown, run, drained, allowed to seep, or otherwise disposed; into any of the streams or waters of Indiana any organic or inorganic matter that causes or contributes to a polluted condition of any of the streams or waters of Indiana..." Therefore, this Act protects waters of the state from pollution irrespective of the specific activity from which the pollution is generated.

IC 13-15-1-2 Provides that the WPCB shall establish requirements for the issuance of permits to control water pollution. The rules may include appropriate management measures to prevent or abate water pollution as necessary. Furthermore, IDEM may issue administrative orders to cease a violation and to abate the condition of pollution. IC 13-18-4-6. Such orders would, among other things, require that the "alleged violator take specific action to correct the violation." IC 13-30-3-4(2) (B)(i). Additionally, IDEM may obtain court orders for injunctive relief pursuant to IC 13-30-4-1(b)(2) and/or IC 4-21.5-6-6(1). The remedy request for action could include management measures such as those suggested in the Section 6217(g) guidance. Furthermore, while the majority of the water programs in Indiana are permit-related, IDEM has the authority to control and prevent non-point source pollution in the absence of a permit as well and require implementation of the Section 6217(g) measures, as necessary, including those for agriculture, urban development, roads, highways and bridges, hydromodification, and wetlands and riparian areas.

IDEM is not required to wait for a nonpoint source violation to occur before taking action. Pursuant to IC 13-18-4-6, IDEM may issue administrative orders against a person who "is violating or is about to violate" the rules provided under the WPCA. Additionally, IDEM may take "appropriate steps to prevent any pollution that is determined to be unreasonable and against public interests in view of the condition in any stream or other waters of Indiana." IC 13-18-4-4. Therefore, IDEM has specific statutory authority to proactively prevent non-point source pollution from occurring. Any person violating the above provisions is subject to civil penalties. IC 13-30-4-1.

IDEM has promulgated water quality standards that also apply to non-point sources of pollution. The WPCB has specific authority to establish rules to determine what qualities and properties of water indicate a polluted condition of the water in any of the streams or waters of Indiana. IC 13-18-4-1. The minimum surface water quality standards (MSWQS) specify minimum conditions for waters within the Great Lakes system. Pursuant to 327 IAC 2-1.5-8 "All surface waters at all times and all places...shall meet the minimum conditions of being free from substances, materials, floating debris, oil, or scum attributable to municipal, industrial, agricultural, and other land use practices..." A person violating these standards is subject to an administrative order requiring the person to cease the violation and abate the condition of pollution, as well court orders for injunctive relief. IC 13-18-4-6, 13-40-4-1(b)(2), 4-21.5-6-6(1). The remedy request for action could include the implementation of management measures such as those suggested in the Section 6217(g) guidance.

---

[1] Pursuant to House Enrolled Act 1002-2012 (Public Law 133-2012), the WPCB was abolished effective January 1, 2013 and replaced by the Environmental Rules Board. The new board will have essentially the same powers and duties as those outlined in this opinion, and the legislative change will not affect IDEM's ability to prevent and control nonpoint source pollution.

Finally, if the controls available to IDEM at present are not sufficient to address non-point source pollution, the WPCB has ample authority to craft additional regulations as necessary. The Board is given broad authority to "adopt rules for the control and prevention of pollution in waters of Indiana with any substance that is deleterious to the public health ...or by which any fish life or any beneficial animal or vegetable life may be destroyed; or the growth or propagation of fish life or beneficial animal or vegetable life is prevented for injuriously affected." IC 13-18-3-1. Additionally, the Board may adopt rules restricting the polluting context of any waste material and polluting substances discharged or sought to be discharged into any of the streams or waters of Indiana. IC 13-18-4-3.

CONCLUSION

All of these general authorities, which taken together with the regulations promulgated by the Water Pollution Control Board provide IDEM with the authority to prevent and control non- point source pollution within Indiana and require implementation of the 6217(g) management measures, as necessary, including those for agriculture, urban development, roads, highways and bridges, hydromodification, and wetlands and riparian areas.

Please let me know if you need anything further in this regard.

Sincerely,

Matt Light
Chief Counsel
Advisory & ADR Services

Division cc: Nancy King, IDEM Office of Legal Counsel

Appendix H

Stakeholder Input Questionnaire for Indiana Nonpoint Source Management Program Plan (Program)

Thank you for taking the time to fill out our questionnaire. Please answer to the best of your abilities the questions below:

1) A SWOT Analysis is a method used to evaluate the **S**trengths, **W**eaknesses/Limitations, **O**pportunities, and **T**hreats involved in a project. Please provide your perspectives on the following:

   a) **S**trengths: *internal* characteristics of the Program that give it an advantage over others

   b) **W**eaknesses: *internal* characteristics that place the Program at a disadvantage relative to others

   c) **O**pportunities: *external* chances to improve performance of the Program

   d) **T**hreats: *external* elements in the environment that could cause trouble for the Program

2) What broad goals do you think should be incorporated into the Program?

3) What specific objectives do you think should be incorporated into the Program?

4) In your opinion, what is the best strategy to reduce NPS pollution?

5) What role do you see your organization as having in the future NPS pollution control activities?

Appendix I

Stakeholders targeted to receive questionnaire

Organization	Contact
Alliance of Indiana Rural Water	Toby Days
DNR - Coastal Program	Mike Molnar
DNR - Contaminants	Doug Keller
DNR - Forestry	Duane McCoy
DNR - LARE	Greg Biberdorf
DNR - Parks & Reservoirs	Dan Bortner
DNR - Reclamation	Steve Herbert
DNR - Water	Dave Nance
Ducks Unlimited	Dave Neal
Ducks Unlimited	Jim Frantz
Ducks Unlimited	Joe Borders
Farm Bureau	Justin Schneider
Friends of the St. Joe	Leah Cooper
Farm Service Agency	Michelle Howell
Grand Cal AOC	Ashley Snyder
Greater Wabash RC&D	Rhonda Hicks
Historic Hoosier Hills RC&D	Terry Stephenson
Hoosier Environmental Council	Jesse Kharbanda
Hoosier Environmental Council	Kim Ferraro
Hoosier Heartland RC&D	Liz Rice
Indiana Association of Cities and Towns	Matt Greller
Indiana Association of Soil and Water Conservation Districts	Jennifer Boyle Warner
IDEM - 401	Jason Randolph
IDEM - Ag	Steve Howell
IDEM - Air Programs	Brian Wolff
IDEM - Brownfields	Kevin Davis
IDEM - Confined Feeding	Travis Goodwin
IDEM - Combined Sewer Overflow	Dave Tennis
IDEM - Ground water	Jim Sullivan
IDEM - Hoosier Riverwatch	Lisa Ritter-McMahan
IDEM - MS4	Reggie Korthals
IDEM - OLQ Municipal Solid Waste	Jeff Harmon
IDEM - Office of Pollution Prevention and Technical Assistance	Jessica Faust-Hamblin

Organization	Contact
IDEM - Solid Waste	Randy Jones
IDEM - WAP Branch	37 members
Indiana Environmental Health Association	Josh Williams
Indiana Geological Survey	Shawn Naylor
Indiana Lakes Management Society	Sara Peel
Indiana Association of Floodplain and Storm water Managers	Daryl Helfert
Indiana Agriculture Resource Council	Amy Cornell
Indiana Chapter of American Planning Assoc	Shane Burkhardt
Indiana Conservation Alliance	Angela Hughes
Indiana Land Use Consortium	Jaime Palmer
Indiana Smallmouth Alliance	Web entry
Indiana Wildlife Federation	Barb Simpson
Indiana Department of Transportation	Nathan Saxe
Indiana Department of Transportation	Ronnie Boehm
Indiana State Department of Agriculture	Deb Fairhurst
Indiana State Department of Agriculture	Logan Garner
Indiana State Department of Health	Mike Mettler
Indiana University-Purdue University Indianapolis	Bob Barr
Indiana University-Bloomington	Melissa Clark
Indiana Water Environment Association	Scott Grimes
Indiana Watershed Leadership Academy	Laura Esman
Indiana Water Resources Association	Phil Bonneau
Jeri Ziliack/Jim Droege	Southwest IN Brine Coalition
Kankakee River Basin Commission	Jody Melton
Lagrange County Lakes Council	Leslie Raymer
Lincoln Hills RC&D	Betsy Wilkinson
Little Calumet River Basin Commission	Dan Repay
Manchester College	Jerry Sweeten
Marshall County Lakes & Water Council	John Ulrich
Maumee River Basin Commission	Rod Renkenberger
Middle Eel River Watershed Initiative	Terri Michaelis
MS4 - Community	Eric Henion
National Park Service	Charlie Morris
Northwest Territory RC&D	Andy Vasquez
Natural Resources Conservation Service	Chris Ritz
Natural Resources Conservation Service	Jill Reinhart
Natural Resources Conservation Service	Roger Kult
Office of the Indiana State Chemist	Dave Scott

Organization	Contact
ORSANCO	Greg Youngstrom
Patoka Lake Regional Water & Sewer Dist	Bruce Heeke
Pheasants Forever	Brian Nentrup
Purdue	Jane Frankenberger
Purdue	Jim Mintert
Purdue Extension	Scott Gabbard
Rural Community Assistance Program	Vicki Perry
Save the Dunes	Jennifer Birchfield
Sierra Club	Bowden Quinn
State Revolving Loan Fund	Emma Kottlowski
State Soil Conservation Board	Larry Clemens
St. Joseph River Basin Commission	Karen Mackowiak
St. Joseph River Watershed Initiative	Greg Lake
Steuben County Lakes Council	Bill Schmidt
Steuben County Lakes Council	Jim Aikman
Surveyors	Chris Knochel
Soil and Water Conservation Society	Becky Ross
Sycamore Trails RC&D	Mike Wilkinson
Taylor University	Mike Guebert
The Nature Conservancy	Kent Wamsley
The Nature Conservancy	Larry Clemens
Trout Unlimited Central Indiana	Web entry
Trout Unlimited Northern	Mike Beachy
Upper Wabash River Basin Commission	Stacia Henderson
U.S. Army Corps of Engineers	Roger Setters
U.S. Fish and Wildlife Service	Scott Pruitt
U.S. Geological Survey	Bill Guertal
Upper White River Watershed Alliance	Jill Hoffmann
West Central Indiana Watershed Alliance	Lisa Holscher
White River RC&D	Whitney Sauerheber
Wildcat Guardians	Sarah Brichford
Western Lake Erie Basin	Carrie Volmer-Sanders
Wood-Land-Lakes RC&D	Lisa Ledgerwood
Wabash River Enhancement Corp.	Stanton Lambert

Appendix J

Section 319 Grant Program Eligible
NRCS Field Office Technical Guide Practices

Practice Name	Key Requirements
Access Control	1. Livestock exclusion only from stream, wetland or woodland. 2. Area protected must have a minimum of 30 ft distance to water in the case of streams, measured from barrier to water's edge.
Access Road	1. Must be used as approach to stream crossing (578). Distance determined on a case-by-case basis. 2. One way traffic only.
Agrichemical Handling Facility	
Animal Mortality Facility	
Animal Trails and Walkways	
Composting Facility	
Comprehensive Nutrient Management Plan	1. Must follow EQIP Conservation Activity Plan (Practice Code 102). 2. For CNMP development, the NRCS CNMP Review Checklist must be completed and signed by the landowner, a Certified CNMP Developer, and an Approved NRCS CNMP Reviewer, if appropriate.
Conservation Cover	
Constructed Wetland	
Contour Buffer Strip	
Contour Farming	
Cover Crop	1. The cover crop cannot be mechanically harvested for grain, seed or forage. This includes dry hay, straw, baleage, silage, haylage, green chop, etc. 2. Grazing of cover crops is allowed if used to address an existing resource concern caused by existing livestock, and the cover crops will be grazed according to a grazing plan. 3. Funds may be used to establish the cover crop only (does not include removal). 4. This practice is required to be maintained for one season. A farmer is eligible to receive cost-share on a field a maximum of 3 times.
Critical Area Planting	

Denitrifying Bioreactor	
Diversion	
Drainage Water Management	
Fence	1. Only eligible if used to exclude livestock under (472) Access Control or for pasture management that meets (528) Prescribed Grazing standard. 2. Temporary fence is not eligible under this practice.
Field Border	
Filter Strip	
Forage and Biomass Planting	
Grade Stabilization Structure	This practice may not be used in a water of the State unless appropriate permits have been obtained.
Grassed Waterway	
Heavy Use Area Protection	
Integrated Pest Management	1. For pest management plan development, the NRCS Pest Management Plan Checklist must be completed and signed by the producer/operator and a Certified Pest Management Specialist. 2. For PMP implementation, the item that was completed in the PMP that produced an outcome must be listed on the cost-share form.
Irrigation Water Management	1. Eligible only for existing irrigation systems. Participant must have irrigated 2 of the past 5 years. 2. A Uniformity Test and flow monitoring is required. 3. Cost-share is for detailed record keeping and data collection, and irrigating according to an approved irrigation scheduling program (such as Purdue's Michiana Irrigation Scheduler or equivalent). 4. Management must decrease non-point source pollution of surface or ground water resources.
Land Reconstruction, Abandoned Mine Land	
Lined Waterway or Outlet	1. Must be applied as part of a resource management system. 2. This practice may not be used in a water of the State unless appropriate permits have been obtained.
Mulching	Only eligible to support another practice for the purpose of establishment of permanent vegetative cover.

Nutrient Management	1. For nutrient management plan development, the Nutrient Management Plan Checklist must be completed and signed by the producer/operator and a Certified Nutrient Management Specialist. 2. For NMP implementation, the item that was completed in the NMP that produced an outcome must be listed on the cost-share form.
Open Channel	1. 2-stage ditch only. 2. Eligible for existing constructed channels with > 1 square mile drainage area. 3. Site evaluation by person with adequate engineering approval is required prior to implementation.
Pipeline	Must be in conjunction with exclusion fencing (382), watering facility (614), or prescribed grazing (528).
Pond	1. Eligible only for livestock watering. Livestock must be excluded from accessing the pond. 2. Must be sized for the grazing need or the minimum to meet standards.
Prescribed Burning	1. The Prescribed Burn Plan must be reviewed and signed by the Burn Boss and a Fire Manager who are familiar with the fuel type being used. 2. Must obtain a Variance from the IDEM Office of Air Quality. 3. Must be implemented to prepare site for an additional approved vegetative BMP.
Prescribed Grazing	Must follow the "Additional Criteria to Improve or Maintain Surface and/or Subsurface Water Quality and Quantity" in the standard.
Pumping Plant for Water Control	Eligible only for livestock watering.
Residue and Tillage Management, Mulch Till	1. This practice must either be used as a transition from conventional tillage to the Residue and Tillage Management, No Till/Strip Till (329); or Mulch-Till must meet the "modified No-Till" criteria; or applicant must prove that the current system's soil loss is above "T" and this practice will take it below "T". 2. Applicant must have mulch-tilled/modified no-tilled and/or no-tilled for no more than 5 consecutive years in order to be eligible. 3. Must develop nutrient management (590) and pest management (595) plans that are specific for a mulch-till system, and have any component critical to the success of the system implemented the fall prior to the implementation of mulch-till.
Residue and Tillage Management, No Till/Strip Till	1. Applicant must have no-tilled for no more than 5 consecutive years in order to be eligible. 2. Must develop nutrient management (590) and pest management (595) plans that are specific for a no-till system, and have any component critical to the success of the system implemented the fall prior to the implementation of no-till.
Riparian Forest Buffer	
Riparian Herbaceous Cover	

Roof Run-off Structure	1. Must limit storm water run-off, thus reducing soil erosion and increasing the infiltration rate. 2.This practice includes cisterns and rain barrels.
Spring Development	Must be in conjunction with exclusion fencing (382) or prescribed grazing (528).
Storm water Run-off Control	May not be used to implement practices for the purpose of meeting any State Rule or National Pollutant Discharge Elimination System (NPDES) Storm Water Program requirements. These requirements most often apply to Rule 5 (327 IAC 15-5) and Rule 13 (327 IAC 15-13), which is also known as the Municipal Separate Storm Sewer System (MS4) rule.
Streambank and Shoreline Protection	Bioengineering and/or vegetative establishment only.
Stream Crossing	1. May only be used in conjunction with exclusion fencing (382) to limit livestock access to water of the State, or for equipment crossing in conjunction with Access Road (560). 2. For livestock access, the practice must be sited and constructed in a manner to deter loafing time in the stream.
Stream Habitat Improvement and Management	This BMP is considered a secondary practice.*
Strip Cropping	Crop strips will be no wider than 360 feet.
Structure for Water Control	Only as needed for a drainage water management system (554).
Subsurface Drain	Must be used in conjunction with a Grassed Waterway (412), Diversion (362), Drainage Water Management System (554), WASCOB (638), or other approved BMP in which subsurface drainage is necessary.
Terrace	
Tree and Shrub Establishment	Must be used for long-term erosion control and improvement of water quality.
Underground Outlet	Must be used in conjunction with a Terrace (600), Grassed Waterway (412), Diversion (362), Drainage Water Management System (554), WASCOB (638), or other approved BMP in which subsurface drainage is necessary.
Vegetated Treatment Area	This BMP is considered a secondary practice.*
Waste Facility Cover (Roofs and Covers)	

Waste Storage Facility	1. Must be above and beyond permit requirements. 2. If waste facility is on a property that does not contain animals there must be a contract in place to receive manure for at least 10 years. 3. A CNMP must be written, delivered and certified prior to the start of the waste storage facility.
Waste Utilization	1. 319 funds may only be used for technology (including equipment modifications) that reduces or eliminates surface application of manure or that increases application efficiency such as no-till manure injection, variable rate controllers, and Geographic Positioning Systems. 2. Must be above and beyond permit requirements. 3. Soil test must have been completed within the last 4 years to be valid. The minimum number of acres necessary for manure application shall be based on the IDEM "Manure Application Land Requirements." 4. Only fields with a soil test phosphorus level of <50 ppm (100 lbs) per acre will be eligible. 5. Manure must be applied in accordance with a Waste Utilization Plan, Nutrient Management Plan, or CNMP for the field. 6. Does not include any aspect of transport or hauling of waste.
Water and Sediment Control Basin	1.Nutrient Management (590) and Integrated Pest Management (595) must already be implemented or implementation started within the year the structure is being built. 2. Fields within the watershed of the structure must be managed to "T", or practices must be installed in the year the structure is built that brings the soil loss to "T". 3. All of these requirements apply within the entire drainage area of the WASCOBs, whether on the applicant's land or adjacent land.
Water Well	Only for livestock watering.
Watering Facility	1. Must be used in conjunction with exclusion fencing (382) and/or prescribed grazing (528). 2. Reimbursed only for livestock watering.
Wetland Creation	
Wetland Enhancement	
Wetland Restoration	

Appendix K

Status Table of CZARA Section 6217 Conditions

Agricultural Sources

	Management Measures	Status	Comments	What this means for 319
A	Erosion and Sediment Control (on cropland)	Not Complete	Programmatic elements in place.	Describe how State plans to Monitor and track program implementation. Demonstrate link between enforcing and implementing agencies.
B	Confined Animal Facility	Not Complete	Programmatic elements in place.	Describe how State plans to Monitor and track program implementation. Demonstrate link between enforcing and implementing agencies.
C	Nutrient Management	Not Complete	Programmatic elements in place.	Describe how State plans to Monitor and track program implementation. Demonstrate link between enforcing and implementing agencies.
D	Pesticide Management	Not Complete	Programmatic elements in place.	Describe how State plans to Monitor and track program implementation. Demonstrate link between enforcing and implementing agencies.
E	Livestock Grazing	Not Complete	Programmatic elements in place.	Describe how State plans to Monitor and track program implementation. Demonstrate link between enforcing and implementing agencies.
F	Irrigation	Exempt	N/A	N/A

Forestry – exempt

Urban Areas

	Management Measures	Status	Comments	What this means for 319
	II. Urban Run-off			
A	New development	Complete	MS4	
C	Site development	Complete	MS4	
	III. Construction Activities			
A	Construction site erosion and sediment control	Exempt		
B	Construction site chemical control	Exempt		
	IV. Existing Development			
A	Existing Development	Not Complete	Programmatic elements in place.	Describe the link between the enforcing and implementing agencies to support the legal opinion. Describe how State plans to Monitor and track program implementation.
	V. Onsite Disposal Systems			
A	New onsite disposal systems	Complete		
B	Operating onsite disposal systems	Not Complete	Continue working with ISDH to promote model ordinance for OSDS inspection and operation. Continue working with the coastal OSDS workgroup to develop outreach and education program, research lender point of sale inspection program and SRF loan program for septic upgrade and repair. Map priority coastal septic system areas.	Continued education and coordination to address all 6217 measures with partner agencies and organizations.
	VI. Pollution Prevention			
A	Pollution Prevention	Complete		Continued education and coordination to address all 6217 measures with partner agencies and organizations.
	VII. Roads, Highways, and Bridges			
A	Planning, siting, and developing roads and highways	Complete		

	Management Measures	Status	Comments	What this means for 319
B	Bridges	Complete		
C	Construction projects	Complete		
D	Construction site chemical control	Complete		
E	Operation and Maintenance			N/A
F	Road, Highway, and Bridge Run-off Systems			N/A

Marinas and Recreational Boating

	Management Measures	Status
	II. Siting and Design	
A	Marina Flushing	Complete
B	Water Quality Assessment	Complete
C	Habitat Assessment	Complete
D	Shoreline Stabilization	Complete
E	Storm water Run-off	Complete
F	Fueling Station	Complete
G	Sewage Facility	Complete
	III. Marina and Boat Operation	
A	Solid Waste	Complete
B	Fish Waste	Complete
C	Liquid Material	Complete
D	Petroleum Control	Complete
E	Boat Cleaning	Complete
F	Public Education	Complete
G	Maintenance of Sewage Facilities	Complete
H	Boat Operation	Complete

Hydromodification

	Management Measures	Status	What this means for 319
	II. Channelization and Channel Modification		
A	Physical and chemical characteristics of surface waters	Not Complete	Programmatic measures met. Describe link between enforcing and implementing agencies. Describe how State plans to Monitor and track implementation of 6217 measures
B	Instream and riparian habitat	Not Complete	Programmatic measures met. Describe link between enforcing and implementing agencies. Describe how State plans to Monitor and track implementation of 6217 measures

	III. Dams		
A	Erosion/sediment control	Exempt	
B	Chemical and pollutant control	Exempt	
C	Protection of surface water quality and instream and riparian habitat	Not Complete	Programmatic measures met. Describe link between enforcing and implementing agencies. Describe how State plans to Monitor and track implementation of 6217 measures.
	IV. Streambank and Shoreline Erosion		
A	Eroding stream banks and shorelines	Not Complete	Programmatic measures met. Describe link between enforcing and implementing agencies. Describe how State plans to Monitor and track implementation of 6217 measures.

Wetlands, Riparian Areas, and Vegetated Treatment Systems

	Management Measures	Status	What this means for 319
A	Protection of wetlands and riparian areas	Not Complete	Additional programmatic information requested. Describe link between enforcing and implementing agencies to support legal opinion. Describe how the state plans to monitor and track the implementation of 6217 measures.
B	Restoration of wetlands and riparian areas	Not Complete	Programmatic condition not met. Describe programs state may have to promote restoration of pre-existing functions in damaged and destroyed wetlands that provide NPS abatement. Describe link between enforcing and implementing agencies to support legal opinion. Describe how the state plans to monitor and track the implementation of 6217 measures.
C	Vegetated treatment systems	Not Complete	Additional programmatic information requested. Describe link between enforcing and implementing agencies to support legal opinion. Describe how the state plans to monitor and track the implementation of 6217 measures.

Monitoring and Tracking Techniques

	Management Measures	Status	What this means for 319
	Monitoring of measures	Not Complete	Develop a monitoring plan to assess over time the 6217 management measures in reducing pollutant loads and improving water quality

Critical Coastal Areas, Additional Management Measures, and Technical Assistance

	Management Measures	Status	What this means for 319
A	Critical coastal areas	Not Complete	Provide additional information on the process for the identification and revision of critical coastal areas
B	Technical Assistance	Not Complete	Describe the types of existing technical assistance programs Indiana employs to address nonpoint source issues within the major CZARA land use categories (ag., urban, marinas, hydromod, wetlands, and riparian areas)
C	Selection of Additional Measures	Not complete	Provide additional information on what process the state will use to identify additional management measures to achieve and maintain applicable water quality standards and protect designated uses.

Appendix L

Outstanding State/National Resource Waters, High Quality Waters

Indiana Outstanding State Resource Waters as of 2/14/2012

The following listing is based upon 327 IAC 2-1-2(3), 327 IAC 2-1.5-19(b), and IC 13-18-3-2(u) [which added all exceptional use waters (listed in 327 IAC 2-1-11(b) and which are listed as items (7) thru (17) below]:

(1) The Blue River in Washington, Crawford, and Harrison Counties, from river mile 57.0 to river mile 11.5. (HUC 0514010407, 0514010408, 0514010409)

(2) The North Fork of Wildcat Creek in Carroll and Tippecanoe Counties, from river mile 43.11 to river mile 4.82. (HUC 0512010704)

(3) The South Fork of Wildcat Creek in Tippecanoe County, from river mile 10.21 to river mile 0.00. (HUC 0512010703)

(4) Cedar Creek in Allen and DeKalb counties, from river mile 13.7 to its confluence with the St. Joseph River. (HUC 04100000308)

(5) The Indiana portion of the open waters of Lake Michigan.

(6) All waters incorporated in the Indiana Dunes National Lakeshore.

(7) Big Pine Creek in Warren County downstream of the State Road 55 bridge near the town of Pine Village to its confluence with the Wabash River. (HUC 05210010804)

(8) Mud Pine Creek in Warren County from the bridge on the County Road between Brisco and Rainsville to its confluence with Big Pine Creek. (HUC 50120010803)

(9) Fall Creek in Warren County from the old C.R. 119 bridge in the NW quarter of Section 21, Township 22N, Range 8W downstream to its confluence with Big Pine Creek. (HUC 05120010804)

(10) Indian Creek in Montgomery County from the County Road 650 West bridge downstream to its confluence with Sugar Creek. (HUC 0512011006)

(10) Clifty Creek in Montgomery County within the boundaries of Pine Hills Nature Preserve. (HUC 0512011006)

(11) Bear Creek in Fountain County from the bridge on County Road 450 North to its confluence with the Wabash River. (HUC 05120010806)

(12) Rattlesnake Creek in Fountain County from the bridge on County Road 450 North to its confluence with Bear Creek. (HUC 0512010806)

(13) The small tributary to Bear Creek in Fountain County within the Portland Arch Nature Preserve which enters Bear Creek at the sharpest bend and has formed the small natural bridge called Portland Arch. (HUC 0512010806)

(14) Blue River from the confluence of the West and Middle Forks of the Blue River in Washington County downstream to its confluence with the Ohio River. (HUC 0514010407, 0514010408, 0514010409)

(15) The South Fork of Blue River in Washington County from the Horner's Chapel Road bridge downstream to its confluence with Blue River. (0514010406)

(16) Lost River and all surface and underground tributaries upstream from the Orangeville Rise (T2N, R1W, Section 6) and the Rise of Lost River (T2N, R1W, Section 7) and the mainstem of the Lost River from the Orangeville Rise downstream to its confluence with the East Fork of White River. (HUC 0512020812, 0512020813)